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Editorial Notes

Compressed Gas for Motor Transport

As recorded in the "JOURNAL" last week, the Government does not at present intend to ration coal gas as fuel for motor vehicles. It is not proposed either to prohibit flexible containers for gas from being carried on the roofs of motor vehicles or on trailers, and no special restrictions are likely to be imposed on the use of gas in steel cylinders beyond those already enforced on grounds of safety.

We have discussed the use of both low-pressure and high-pressure gas for motor transport on broad lines in these columns, without, however, entering into any great detail; and it might be well at this stage to examine the matter a little more closely. We wonder how many in the Gas Industry realize to what extent the technique of employing compressed gas has been developed in recent years by the Birmingham Gas Department in particular, which, as is well known, was a pioneer in this regard. During the period 1931-34 much was said and much was written on the subject, and interest in the technical possibilities of compressed gas ran high. It was during the economic crisis of 1931, when the country saw the desirability of using a home produced fuel, that the Birmingham Gas Committee sanctioned a sum of money for research on the problem, and quite remarkable work, which may have far-reaching results, has been accomplished. But during the past five years, apart from investigations and experiments by a few gas undertakings, interest and enthusiasm have seemingly waned. That is, until the outbreak of war and the rationing of imported fuel. War conditions have placed an entirely new complexion on the matter, and peace-time comparisons between gas and petrol and fuel oil have temporarily to go by the board. The technique and the economics of gas for motor transport must be examined afresh in the light of the emergency circumstances.

It can be said at once that, thanks very largely to the work undertaken by the Birmingham Gas Department, work under the direction of Dr. C. M. Walter, whose enthusiasm has never flagged, the technique of 1939 is very different from that of, say, 1933. The Gas Industry is now in a position to put forward a far better proposition for the use of compressed gas for motor transport than it was five years ago. It can be said that the experimental stage has been passed and that the soundness of the method from a technical and a practical point of view has been thoroughly proved. With a compression ratio of 7.2:1 town gas has an efficiency of 95% as compared with petrol, and gas consumption can be reduced by over 30% when using a compression ratio of 15:1 compared with a compression ratio of 7:1. An engine designed to use town gas as a fuel will compare favourably with fuel oil. The technical problems involved in the substitution of gas for the propulsion of motor vehicles have been solved. An engine of the ordinary type can be converted without any difficulty to town gas running, and 1¼ therms (250 cu.ft. of 500 B.Th.U. gas) can under these conditions be regarded as the equivalent of a gallon of petrol. Lorries or 'buses could carry enough town gas for a 60-75 mile journey, and the filling of the cylinders is a simple matter. The range of the vehicle depends, of course, on the calorific value of the gas. The cost of compression would be reduced and the operating radius increased in proportion to the calorific value.

In certain circumstances the substitution of town gas for imported fuel has been worked out as a reasonable economic proposition in peace-time. War-time conditions, as we have said, have put an entirely different aspect on the whole problem. There must be many commercial firms which have at any rate part of their transport fleet lying idle for want of petrol. They could turn to gas as a substitute, and many would do so, we feel sure, if they knew definitely that the necessary steel bottles would be available. These are not available at present, and it would be a good thing for all concerned if the Government were to give a lead in this regard. With bottles available, we do not think that the manufacture of the necessary compressing equipment would involve great difficulty.

In regard to compressing plant, a great deal of headway in design has been made as a result of Birmingham research in co-operation with the manufacturers since 1934. A highly efficient 6-stage compressor has been developed and is in operation having a working capacity of 100 cu.ft. of free gas per minute. It is considered that compressors of this capacity represent the smallest permissible economic units. We have before us some very interesting equivalent cost figures of

compressed town gas and petrol, based on the employment of compressors of this capacity and a final gas pressure of 5,000 lb. per sq.in. One case which we have had put to us allows for a compressing station with two such units, electrically driven, each running 18 hours per day, 6½ days per week, and 52 weeks per year, with 5,000 lb. per sq.in. storage capacity for half-a-day's output of each machine. Capital costs, including compressors (£4,500), storage bottles (£5,500), and compressing station buildings (£1,000) would amount to £11,500. Capital charges, with interest at 5%, depreciation and maintenance on compressors at 15%, depreciation and maintenance of storage bottles at 10%, and maintenance of buildings, would amount to £1,850. Operating costs, with electricity at 0.8d. per unit, would figure out at £2,778—a total of £4,628 a year. Assuming that the equivalent of one gallon of petrol is 1¼ therms, the output of the plant would be 243,000 gallons a year. The cost of compressing per equivalent gallon would work out at 4.6d., and if cost of gas per equivalent gallon is taken at 5d. per therm we get a total cost per equivalent gallon of 11.9d. In addition, of course, there would be the capital and depreciation charges on the vehicle equipment. But, as we have said, the compressed gas scheme could render possible the operation of a fleet of vehicles which would otherwise be laid by. The whole question must be looked at from the angle of the peculiar conditions imposed by war.

The estimated costs of a compressed gas scheme for a fleet of 'buses were set out in a Paper early this year to the Institution of Automobile Engineers by Dr. J. S. Clarke, of the Industrial Research Laboratories of the Birmingham Gas Department. He based his estimates on a fleet of 40 'buses; mileage per 'bus per day 100; petrol consumption per mile 0.2 gallon; gas consumption per mile 50 cu.ft. The capital cost of compressing and storage plant he gave as £11,000, and of vehicle equipment £6,400. Compressing costs (electricity at 0.6d. per unit) he worked out as 13.3d. per 1,000 cu.ft., and interest and depreciation on vehicle equipment at 4.5d. per 1,000 cu.ft. Assuming gas at inlet to compressor to be 4d. a therm, he gave the total of gas on the vehicle as 37d. per 1,000 cu.ft. This, at 250 cu.ft. per equivalent gallon, works out at a little over 9d. a gallon.

There does seem to be a very strong case for serious consideration and encouragement by the Government of the use of compressed town gas for motor transport, and for a lead in regard to the supply of the raw material needed for the equipment to make this use possible.

Low-Pressure Gas for Motor Vehicles

THERE is also, of course, the use of low-pressure gas for motor transport, and much has been done already in this regard to help automobile engineers and foster their co-operation. It was unnecessary to arouse their interest in the matter. In to-day's "JOURNAL" we publish an account of a meeting of automobile engineers which took place last week at the Gas Light and Coke Company's premises at Watson House, when they were able to examine one of the Company's lorries which had been converted from petrol to gas, using the fabric bag method. A small van converted by the South Metropolitan Gas Company was also on view. It was stated at that meeting that the London gas undertakings considered that the selling of the gas for the purpose was the business of the petrol stations, and that the gas undertakings had no wish to compete in the field. The need for the standardization of the filling point attached to the gas bag, not only in London but throughout the country, was emphasized. The Industrial Gas Centres Committee will shortly meet to discuss the whole problem of low-pressure gas for motor vehicles, and it is the intention—a very wise one—to set up a special committee consisting of representatives of the Gas Industry, the Institution of Automobile Engineers, and the manufacturers of bags, so that the sizes of bags may be standardized. It would obviously only complicate matters and make the bags more expensive if each automobile engineer ordered bags of different sizes, probably varying only by inches.

The gas bag is hardly a beautiful or a convenient object, and the amount of gas it contains allows of only a very limited range. The time taken in filling the bag must also be taken into account—and this amounts to between 10 and 15 minutes. But the low-pressure method is a simple one and the equipment required is inexpensive. It is a ready means by which cars can be kept on the road, which is advantageous to trade in general, and particularly to the motor industry. As for the metering of the gas at the filling stations, the automobile engineers present at the meeting at Watson House last week had the opportunity of examining the ingenious and simple flowmeter developed by the Gas Light and Coke Company, which device was described in an illustrated article in last week's "JOURNAL." As to cost, it was stated at the meeting that this was a question which individual undertakings would have to decide, though in the London area it was hoped to have a common policy in regard to both standpipes and the price of gas. It would surely be helpful if the Gas Industry as a whole adopted some agreed policy on the matter.

On Carrying On

IT must have been highly gratifying to the President and Council of the Wales and Monmouthshire Association to have, at the luncheon following last week's general meeting, the assurance of Mr. George Dixon, speaking as President of The Institution of Gas Engineers, that the headquarters in London had been delighted at the decision of the Association to "carry on." At the same time, such an assurance could not have been in any way surprising, coming, as it did, from the headquarters of a vital public service. The Industry cannot afford to "slow-down" in any direction in which such a course can be avoided, and the Wales Association (following upon the Manchester Association, whose meeting was reported in last week's "JOURNAL") were right in their resolve to keep the flag flying. Even so, of course, there remained a doubt as to whether, with the difficulties of travel in South Wales, a business meeting would be largely attended; but in the event, there proved to be no reason for anxiety on this score. On the contrary, the policy of the Council gained unqualified endorsement.

The conditions of to-day will not be permanent, and we want to see everything done that it is possible to do in order to enable the Industry "to keep fit" against the time when the wheels of business will be able once more to revolve freely. Much trade is being lost now which will have to be recovered later on. This will be a heavy task under the best conditions—that is, with organizations keyed-up to concert pitch; under the worst conditions, it must prove a great deal harder. "Control" has laid its hand heavily upon our commerce; the first Board of Trade returns to be issued since war was declared (those for September) show a substantial contraction in both imports and exports; and abnormal conditions prevail in every branch of industry. All these present problems must be faced without any flinching; but time must still be found by the harassed workers in the industrial army to plan for the future.

At the moment, we know, the operating difficulties of gas undertakings differ widely, according to the localities in which they may be situated; but the broad basis of policy for the future may be taken as roughly the same for all—business based on good-will. It should ever be borne in mind that the change-over from war to peace, when it comes, may be rapid, and it must find the Gas Industry fully prepared to take advantage of its opportunities. To this end, nothing about the works should suffer from neglect, and the district should be treated as far as possible with an eye to the future. As Mr. Dixon remarked at Cardiff, the Wales Association have determined that, in spite of everything, "not only should they go

on giving the service that they had given before, but they should endeavour, if possible, to give an even better service." That is a policy which may be relied upon to yield a full reward when the heavy clouds have passed away. Should there be—as it is to be feared there must—some directions in which enterprise is temporarily impossible, that would offer a still stronger reason for exploiting to the uttermost such avenues as might remain open.

Street Lighting

DISCUSSING the question of street lighting in the "JOURNAL" last week we said that the experience of the blackout has brought a new focus to bear on the special problems it has brought in its train, and we suggested that expectations have been exceeded of the possible use of illumination units of the order of 0.002 foot-candle—that as a result of investigation there exists more optimism regarding their application than when the units were first designed. Since then a statement has been issued by the Home Secretary in which he explained that his Department was exploring the possibility of devising a type of modified street lighting of very low intensity which would not be visible by raiding aircraft and could be left alight even when a raid was in progress. He said that the types of lighting so far tested had failed to satisfy the conditions required, but he added, in a non-committal way, that further experiments were in progress. We hope that in the not far distant future he will be able to make a more hopeful statement. In the meantime the Gas Industry, which is properly represented on the joint committees to which this experimental work has been entrusted, is, we know, pulling its weight in the investigations which are in hand.

In regard to normal lighting and central control, the Home Secretary stated that if lights were extinguished immediately on public air-raid warning, the sudden change from light to darkness would inevitably create very great confusion in transport services and would be liable to cause panic in the streets. Moreover, it had been conclusively established, by practical experiments carried out with the co-operation of the Royal Air Force, that ordinary street lighting would make an area visible to hostile aircraft from a distance varying, according to weather conditions, up to as much as 40 miles. Extinguishing the lights on receipt of the public air-raid warning would be an insufficient safeguard, for by that time the raiding aircraft might have come within sight of the area. The use of blue lamps or screening such as was used in the last war would not overcome the difficulties. It is, however, highly desirable that the present blackout conditions should be eased if amelioration can be brought about without imperilling the safety of the people. And, as we have said, the Gas Industry is working along with others to try to find a practical and satisfactory solution to a difficult problem.

Pooling Emergency Services

MANY gas undertakings are satisfied that by now their A.R.P. emergency services are perfected, but this does not in any way detract from the peculiar interest attaching to the scheme adopted at Brighton. This is believed, indeed, to be the only one of its kind in existence, embracing as it does both utility service wardens and composite repair parties made up of men drawn from the staffs of all three undertakings—gas, water, and electricity—operating within the supply area common to the three undertakings and covering A.R.P. areas of six separate local authorities.

The Brighton Company freely acknowledge their indebtedness to Mr. Noel S. Smith, whose description of the Bristol A.R.P. scheme in his Paper to The Institution of Gas Engineers last June directed attention to the formation of composite gangs rather than repair parties restricted in personnel to men of each separate utility. It was realized that a high-explosive bomb bursting in a public thoroughfare in almost any built-up area might possibly dislocate all the utility services in the vicinity; and in any event it would not be easy for the air raid warden to differentiate between one service and another in a crater which might be half full of water or debris. The result would possibly be a report of "All services damaged"—to be on the safe side—and the consequent rush to the scene of at least three emergency squads, much of the personnel and equipment of which might be redundant.

To obviate this, the three utility undertakings at Brighton have pooled their resources and instituted the scheme which is outlined in some detail on a later page of this week's "JOURNAL." Inspectors well versed in the distribution systems of all three services and familiar with the special danger points patrol allotted areas and would report damage to the utilities bureau which forms part of the main A.R.P. control centre. This bureau co-ordinates and directs the operations of the composite repair crews, which are able to deal with damage to any service. Tests have proved the scheme to be thoroughly effective and reliable, and the Brighton Company are to be congratulated on instigating the system, with which the other two Corporation-owned undertakings have readily acquiesced, and which must already have served to eliminate considerable duplication of equipment and personnel.

Advantages of Gas-Fired Kilns

War-time conditions offer a further opportunity for the use of gas in the refractories industry. In addition to all its other well-known advantages, gas can help to solve the problem imposed by the black-out restrictions at night. This fact is referred to in a note in the October issue of the *Refractories Journal*, which observes that when a direct-fired kiln is passed in the evening it is

We have been fortunate in securing excellent office accommodation at

51, HIGH STREET, ESHER, SURREY.

(Telephone: Esher 1142)

Will our subscribers, advertisers, and correspondents kindly note this new address, as announced last week, for the "GAS JOURNAL," the "GAS SALESMAN," and allied publications, in lieu of Cluny Lodge, Esher, and accept our apologies for troubling them to register the change? The temporary premises to which we evacuated our records and most of our staff at the outbreak of war are proving inadequate for the considerably increased volume of business which is now passing.

WALTER KING, LIMITED.

realized how difficult it is for manufacturers to shield the glare from such kilns. From a gas-fired chamber kiln, on the other hand, there is not a light to be seen. When, at the same time, we consider the extreme urgency of conserving the nation's fuel it is well to consider the development of such an important improvement. It is gratifying to have this statement from the official organ of the Refractories Association of Great Britain; and gas undertakings in whose areas direct-fired kilns are at work will doubtless seek to make known these facts to the operators, with a view to opening up the channels for valuable increased loads.

N.S.A.S.

After two issues of "Smokeless Air," the new and vastly improved Journal of the National Smoke Abatement Society, we now have—thanks to the war—Special Issue No. 1, a small leaflet of eight pages, the first of a series of news and information bulletins through the channel of which the Society hopes to keep in touch with its friends. It is, of course, wise that the Society should cut out all avoidable expenditure, but it would be a thousand pities if those who have helped the organization to gather strength and, particularly of late years, to emerge into quite an important body influencing public opinion towards the best use of coal, should now entirely withhold their support. Some of the Society's work must be suspended, but some of it should not be allowed to lapse even under conditions of to-day; and we cannot see why—we quote the bulletin—"stringent fuel restrictions must destroy, for the moment, the basis of that change to smokeless methods upon which our case is built." Restrictions on the use of gas and electricity have been relaxed since that was written. True national economy lies in the use of the valuable products which coal contains and will yield on carbonization. More than ever now must the burning of raw coal in the domestic grate be regarded as national waste. The Society's aim for clean skies by the use of smokeless fuels in place of raw coal is undoubtedly in the best national interest.

Personal

After twenty years' service with the British Gas Light Company, Ltd., Mr. C. RHODES ARMITAGE will, on medical advice, be relinquishing his position of Engineer and Manager of the Company's Hull Station at the end of November. Before going to Hull Mr. Armitage served the Company successively as Engineer and Manager of the Potteries Station, Engineer at the Chief Office, and Engineer and Manager of the Norwich Station. Prior to these appointments Mr. Armitage held similar positions with the Lancaster Corporation Gas Department, and the Morecambe and Heysham Corporation.

* * *

W. J. Jenkins & Co., Ltd., advise us that Capt. S. OSWALD PACEY is at the present time serving with the Royal Engineers in the capacity of Staff Officer attached to Headquarters, Aldershot Command.

* * *

Mr. H. C. EXELL, who has been Acting Stores Buyer since January, 1939, has recently been appointed Stores Buyer to the Gas Light and Coke Company in succession to Mr. H. M. Close. Mr. Exell is a Yorkshireman, having been born in Bradford and educated at Leeds Grammar School, and later at the University of London, King's College. His qualifications include B.Sc., Honours (Chemistry), M.Sc. (Fuel Technology), Associate of the Institute of Chemistry and Member of the Purchasing Officers' Association. He joined the Gas Light and Coke Company as assistant in the Works laboratory at Stratford in 1923, was transferred to the Research Department under the Chief Gas Chemist in 1925, and in 1933 was attached to the Managing Director's and Secretary's Department to assist the Standardization Committee. He became Secretary of that Committee in 1936, and in 1938 was appointed Assistant Stores Buyer, becoming Acting Stores Buyer a year later, and Stores Buyer in July this year.

Obituary

Professor R. V. Wheeler

Dr. R. V. Wheeler, Professor of Fuel Technology in the University of Sheffield, died at Stumperlowe Mansions, Sheffield, on Saturday. He was also Director of the Safety in Mines research stations at Sheffield and Buxton and for experimental and demonstration purposes staged many explosions of the kind that occur in collieries.

Richard Vernon Wheeler, who was born on Jan. 8, 1883, was the son of the late R. J. Wheeler, Chief Inspector of Machinery, Royal Navy. He was educated at Plymouth College, at Owens College, Manchester, and he was Dalton Scholar and Fellow of Manchester University. In the course of his career he had been chemist and gas plants manager for Monks, Hall & Co., of Warrington; Chemist to the British Coal Dust Experiments Committee, Mining Association of Great Britain; Chief Chemist to the Explosions in Mines Committee, Home Office; and Testing Officer, Mines Department, Board of Trade. He was a member of numerous learned and other bodies, among which were the Iron and Steel Institute; the Institution of Mining Engineers; the Institution of Petroleum Technologists, Institute of Fuel; the American Institute of Mining and Metallurgical Engineers; the Miners' Lamp Committee; the Safety in Mines Research Board; and the Explosives in Mines Research Committee. From 1924 to 1929 he did good work as a member of the Fuel Research Board and from 1929 to 1930 as a member of the Gas Poisoning Committee of the Board of Trade. He was President of the Midland Institute of Mining Engineers from 1929 to 1932. Wheeler was D.Sc. (Manchester), F.G.S., F.I.C., and F.C.S. In February, 1938, he was awarded the Gold Medal of the Institution of Mining Engineers for outstanding work in the application of scientific knowledge to industrial problems, and last year received the Melchett Medal for services to science.

"Gas Journal" Directory

In order that readers may be able to keep the particulars contained in the "JOURNAL" Directory up to date, we summarize in the following list various changes of which we have been notified during the past month:

Page 4. ASHTON-UNDER-LYNE. R. Thompson, S., resigned.
" 8. BILSTON. K. L. Pearce appointed E. and M.; R. Thompson appointed S. *vice* A. B. Legg retired.
" 10. BRISTOL. R. Robertson appointed G.M., and G. H. Palmer, S., *vice* S. E. Halliwell deceased.
" 16. CHESTERFIELD. C. S. Davies appointed E. and M. *vice* H. Davies retired.
" 20. CROYDON. W. Grogono appointed G.M. as from Jan. 1, *vice* W. J. Sandeman, who joins the Board.
" 48. MOSSLEY. R. Thompson, S., resigned.
" 56. RAWMARSH. V. J. J. Siddons appointed E. and M.
" 138. IMPERIAL CONTINENTAL. E. F. Dadson appointed G.M. *vice* F. H. James, M.D., deceased.

Where There's a Will

The Gas Engineer Finds the Way

Some months ago, at a certain popular seaside resort, 43 "chalets" were built as summer houses. The Gas Engineer persuaded the builder to erect them as all-gas houses. The lighting is all by gas; the kitchen has a gas cooker, the two bedrooms have no fireplaces, but the sitting room is fitted with a panel gas fire, and the bathroom has a 12-gallon (No. 12 "Thermain") storage gas water heater. Slot meters are installed.

The military have now requisitioned these 43 houses as billets for cadets—four to each house. Solid fuel was to be supplied, but owing to the Gas Engineer's enterprise, there was no fireplace for the use of solid fuel. This provided a quandary; the substitution of ordinary meters so that accounts could be rendered to the military authorities was ruled out on account of cost.

But here the resourceful Gas Engineer came in again with his suggestions, with the result that the cadets are actually paid by the military in cash at the rate of 2d. per day per man, in lieu of the free heating, &c., which would have been provided by the use of solid fuel.

Of course, the cooking for the cadets is done at the regimental cookhouse and, as might be expected, by gas.

Forthcoming Engagements

Nov.
14.—N.G.C.—Central Executive Board Meeting, 11 a.m.
17.—Southern Association.—Special Meeting of the General Committee, Gas Industry House, 11.30 a.m.

Dec.
12.—B.G.F.—Fifth Annual General Meeting, Gas Industry House, House, 10.30 a.m.

Letters to the Editor

Shutting Off Gas Mains

SIR,—I have seen with interest Mr. Kennett's article in the "JOURNAL" of Oct. 25. There is one point to which I think attention ought to be called, and that is that the illustrations show the vertical pipe in contact with the surface box. This arrangement would transmit to the gas main the blow given by each wheel passing over the surface box and is dangerous.

There should be an air space or a cushion of clay between the surface box and the vertical pipe, and also between the road concrete and the vertical pipe.

Yours, &c.,

J. F. HASELDINE,
Engineer and General Manager.
Barnet District Gas and Water Company,
Station Road,
New Barnet, Herts.
Oct. 27, 1939.

"Best Use of Gas"

DEAR SIR,—Referring to your editorial in the "GAS JOURNAL" of Oct. 18 entitled "Best Use of Gas," the following are the first five and last six lines of the leading article in *The Times* of yesterday, entitled "Revision of Planning":

> "The plans drawn up for the organization of the nation in time of war have now had seven weeks of preliminary testing. They have been accepted by the nation with great tolerance and good humour. . . . A people who can be relied upon to stand anything necessary to victory have a right to the confession* and to the remedy of errors, none of them fatal, but all of them irritating from the very fact that they are unnecessary. This is not a war to make the world safe for bureaucracy."

When I read the above I thought of the Fuel and Lighting Order, 1939, and paraphrased the last six lines as follows:

> "The Gas Industry, which can be relied upon to stand anything necessary to victory, has a right to the confession and to the remedy of errors, none of them fatal but many of them unnecessary and harmful to all concerned."

Yours, &c.,

D. H. HELPS,
Engineer and Manager.
Reading Gas Company,
Kings Road Works.
Oct. 25, 1939.

*"A confession of ignorance is the door-step to the temple of wisdom."

External Students and the Education Scheme

SIR,—Like many other students, I am at a loss to understand the administration of the Education Scheme of the Institution at this time.

I have been called upon to give up a large proportion of my leisure to A.R.P. instruction, and I am now on the rota for works A.R.P. duties. In addition, there has been overtime on work connected with fuel rationing. I do not want to leave off studying for the various examinations, and I am told that it is not in the interests of the Industry that any student should do so.

Unfortunately, I find that owing to A.R.P. duties I shall have to reduce the number of ancillary subjects I can study this winter, but by doing so I shall fall under new regulations which will give me additional subjects to do. Another whole year's work, in fact.

On the other hand, the new regulations for internal students appear to mean that they will only apply to them when new courses are submitted for approval. There is obviously little likelihood that revised courses are going to be submitted for internal students during the war. In other words, there is to be no change for internal students during the war, but only for external. This is most discouraging.

Another point, since many students have given up a great deal of their time during the early weeks of the war to special services, would it not be reasonable to recognize their efforts by holding the examinations at least a month later?

I feel sure the authorities do not realize how grossly unfair the new regulations are in the present circumstances.

Yours, &c.,

"EXTERNAL STUDENT."

Oct. 28, 1939.

The British Gas Federation

Annual General Meeting

Notice is given by the Joint Secretaries, Messrs. W. J. Smith and W. T. K. Braunholtz, that the fifth Annual General Meeting of the British Gas Federation will be held at Gas Industry House, 1, Grosvenor Place, London, S.W.1, on Tuesday, Dec. 12, at 10.30 a.m.

The proceedings at the Meeting will be restricted to ordinary formal business.

On this occasion, owing to the existence of war conditions, it is not proposed to send individual notices to members of the constituent bodies, but any member of such bodies may apply to the Joint Secretaries at Gas Industry House for a ticket of admission which will be forwarded, together with a copy of the agenda.

Association of British Chemical Manufacturers

In the course of a letter addressed to all members of the Association of British Chemical Manufacturers, Mr. E. V. Evans (Retiring Chairman), Dr. R. Duncalfe (Incoming Chairman), and Mr. J. Davidson Pratt (General Manager) state:

"Our Association was founded as an organization to assist the Ministry of Munitions in the last war; in the present struggle its assistance is already being eagerly sought by Government Departments, and we believe that it will be able to render even greater service; we are satisfied that its continuance with renewed strength is of vital importance to the industry as well as to the nation, not only during the period of destruction we are facing but in the period of reconstruction which will inevitably follow."

Low-Temperature Carbonization*

Narrow Brick Retorts

The carbonization of coal at low temperatures was one of the main lines of investigation decided upon when the Fuel Research Board was established in 1917. An important part of the work has been the design and development at the Fuel Research Station of a type of retort suitable for the production of a free-burning smokeless fuel that could be used in place of the large amounts of raw coal now burned in domestic grates, and at the same time providing an additional source of liquid fuels. The progress achieved in this work has previously been recorded in the Annual Reports of the Fuel Research Board and in Fuel Research Technical Papers Nos. 17 and 35.

A further Paper now published by the Department of Scientific and Industrial Research marks the end of a definite stage in this work. "It is felt," the report states, "that the development of these retorts has proceeded as far as is possible in an experimental establishment, and the present report places on record an account of the experience gained and of certain details of operation."

In the original design of these retorts, described in Fuel Research Technical Paper No. 17, the retorts were made of cast iron. Even with the best material then available, and with careful attention to temperature control, distortion rendered the retorts unworkable after about two years. It was therefore decided, while using the same general design, to build the retorts of firebrick. A setting of two brick retorts, details of which were given in Fuel Research Technical Paper No. 35, was erected in 1932, and since then they have successfully carbonized a wide variety of coals. They have been operated over a considerable range of temperatures, and have shown very little deterioration.

In the report now published the design described and illustrated embodies certain improvements resulting from experience with the original firebrick setting. A description of the method of the operation of the retorts deals particularly with control of throughput and the manipulation of temperature. The method of heating adopted makes possible a wide variation in the distribution or zoning of temperatures over the length of the retort, and is an important feature of the design. This control of temperature zoning, with suitable adjustment of the throughput, imparts a high degree of flexibility to the retorts, which is shown by the fact that they have carbonized 57 different coals, ranging in type from non-caking to strongly-caking and in size from nut coal to slack. Results are given for 30 experiments in these retorts, including analyses and carbonization assays of the coal, carbonizing data, yields of products, and combustibilities of the cokes in open domestic grates.

The report includes a short account of a setting of six of these retorts (later extended to twelve) erected and operated successfully by a commercial concern, and of an experimental setting of two retorts at the Fuel Research Station, built to the same general design but of silica brick, for operation at high temperatures.

* Fuel Research Technical Paper No. 50—Low-Temperature Carbonization—Narrow Brick Retorts at the Fuel Research Station, Part II. Published by H.M. Stationery Office, price 1s. net.

News of the Week

Donations of £100 Each have been given to the Scottish Branch of the Red Cross Society by Colonel Alan Stein and Mr. Norman Stein, of J. G. Stein & Co., Ltd., Castlecary Brick Works.

An Increase in Storage Capacity has been decided upon by the Gainsborough U.D.C. Gas Undertaking. This will involve the acquisition of additional land, terms for the purchase of which are now under consideration. In the meantime the Engineer and Manager, Mr. J. A. Derbyshire, is discussing the question of providing additional producing plant with the makers of the existing plant.

Schemes Estimated to Cost £150,000 have been recommended by the Birkenhead Gas Committee for approval by the Town Council. These include expenditure of £10,000 on mains; £57,000 on the reconstruction of vertical retort plant; £7,312 on air raid precautions; £4,200 on the installation of a benzole plant; and £71,500 on the erection of a new gasholder.

At a Meeting of the Middlesex County Council last week approval was given to a scheme for using surplus methane procured from sewage sludge instead of petrol for motor vehicles. It was estimated that in this way 300,000 gallons of petrol could be saved. Two compressors are to be purchased and it is proposed to start by equipping the vehicles of the Council's main drainage department with the necessary cylinders.

The Restoration of Hire Purchase has been urged upon the Accrington District Gas Board. The Engineer and Manager (Mr. A. J. Harrison) observes that the outstanding balances of goods supplied on hire purchase agreements are not insurable under the War Risks Insurance Act. The Board has altogether some £30,000 worth of gas appliances, and Mr. Harrison has suggested that the Board should reconsider their resolution of a month ago and revert to their original conditions of supplying apparatus on hire-purchase terms.

The Output Report for September of the Aberdeen Gas Department shows a substantial drop in output compared with the same month last year. At a meeting of the Gas Committee on Oct. 25, it was stated that the quantity of gas made was 12,468,000 cu.ft., less than in September of last year, the figures being 124,870,000 cu.ft. compared with 137,338,000 cu.ft. Mr. Harold S. Milne (Gas Engineer and Manager) observes that about half the decreased output was due to the cutting off of street, exterior, and stair lighting, the balance being due to the economy in the use of gas which consumers have imposed upon themselves. On the other hand the revenue for the month from coke shows an increase of £1,207 as compared with the corresponding month of the previous year.

Falkirk Town Council have remitted to a small committee the question of providing plant for the recovery of benzole.

Application is Being Made by the Conway Gas Department for sanction to borrow £5,500 towards the installation of a Humphreys & Glasgow water gas plant and ancillary apparatus.

Owing to the War, the Manchester Public Lighting Committee have given instructions for the removal of the glass-ware from street lamps so far as possible.

Despite the Competition of oil and electricity, the Cambridge University and Town Gas Light Company has secured the contract to provide lighting and heating appliances at 28 Warden's Posts, in connexion with the local A.R.P. Scheme. Gas boilers for decontamination purposes are also being supplied to the Local Authority.

Students in Gas Engineering to the number of 121 attended the last session at the Liverpool Technical College, states the Principal (Mr. Raymond Butler) in his annual report to the City Council. He also observes that there has been good support of the three-year course in gas supply, while useful co-operation has been maintained between the departments of chemistry, engineering, and building.

While Willing to Supply the Gas for driving converted motor vehicles, the Blackburn Gas Department is not to undertake the adaptation of vehicles to carry either gas bags or compressed gas cylinders. Mr. J. D. Ashworth (Gas Engineer and Manager) is reported to have stated that the undertaking is not prepared to instal compressing plant for the use of motor vehicles or commit itself to any other capital outlay.

Slight Adjustments, which Mr. H. Hamer, Lighting Superintendent at Bolton, has made to his system of screening street gas lamps, are not likely to be tested until the moon is on the wane, because Mr. Hamer considers that under present conditions they would not be given a fair trial. The system is not intended to light the streets, Mr. Hamer says, but to provide an "aid to movement" for motorists and pedestrians.

Under Present Conditions, the general discussion on "The Properties and Testing of Heat Insulating Materials," organized by the Joint Committee in conjunction with The Institution of Gas Engineers, arranged for Nov. 23, has been postponed. It is hoped, however, to revive the Discussion when more favourable circumstances prevail. The Institution of Mechanical Engineers, which provides office accommodation for the Joint Committee, has removed temporarily to "The Meadows," Betchworth, Surrey ('phone: Betchworth 63), where the Secretary is available during the day.

Leeds Corporation Gas Department

New Clayton Holder Inaugurated

The new gasholder erected by the Leeds Corporation Gas Department, at Crossgates, to meet the increasing demand for gas in the district was formally put into service by the Chairman of the Gas Committee, Alderman A. R. Bretherick, on Monday, Oct. 23, in the presence of the members of the Gas Committee, the Gas Engineer, and representatives of the Contractors, Messrs. Clayton, Son & Co., Ltd., of Leeds. The gasholder is of 200,000 cu.ft. capacity in steel tank with external guide framing, and embodies the latest improvements in design and construction. The steel tank is 84 ft. diameter, and the external guide framing is constructed in such a way as to minimize the cost of upkeep.

All the steel work was pickled after fabrication and before painting, and the holder is prepared for oil filming.

"City and Guilds" Examinations

The City and Guilds of London Institute announces that its examinations in technological and domestic subjects and its handicraft examinations will be held in 1940 at home and overseas centres.

In a number of subjects, some modifications in the examination arrangements will be necessary, particularly in the arrangements for practical tests and the submission of specimen work. A full statement of these modifications will shortly be issued to local education authorities, technical colleges and secretaries of examinations centres. Any enquiries concerning the examinations should be addressed to the Superintendent, Department of Technology, City and Guilds of London Institute, 31, Brechin Place, London, S.W. 7.

Gas Centenary at Darwen

November marks the centenary of the Darwen Gas Undertaking, but on account of the war it is improbable that the event will receive special recognition. By a curious coincidence, German workmen were engaged on a big scheme of retort improvements when the last war broke out in 1914.

The present works in Charles Street occupy the original site where gas-making was started by the old Over Darwen Gas Lighting Company. The concern was taken over by the Local Board in 1873, five years before the incorporation of Darwen as a borough.

The launching of the undertaking was preceded by a meeting on Aug. 23, 1838, when a committee was appointed to obtain necessary information. A petition to Parliament followed, and on Oct. 31, 1839, a ratepayers' meeting decided to light by gas the main street from Livesey Fold to Bowling Green Mill for eight months in the year. The works came into operation on Nov. 23, the price of gas then being 7s. 6d. per 1,000 cu.ft.

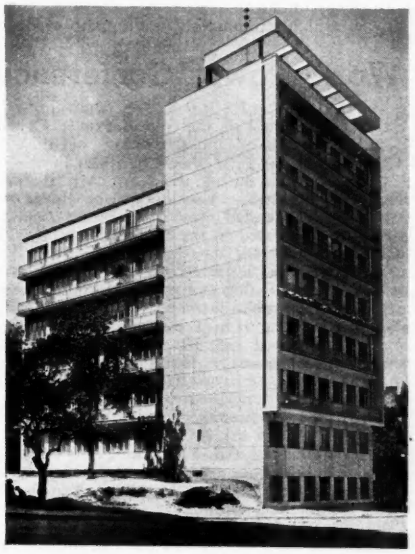
Yorkshire Junior Gas Association

Due to the present international situation and the difficulties of transport, it has not been possible to hold a representative meeting of the Council of the Yorkshire Junior Gas Association to consider the functioning of the Association.

The opinion of the Council Members has been taken by correspondence, and the majority suggest that the activities of the Association should be suspended meantime. It has also been suggested that the situation be reviewed by calling a Council Meeting to be held in December. They will then be in a better position to decide whether it is possible to carry on the work of the Association as usual or introduce some form of modified programme to suit existing conditions.

Gas—and the Modern Poland

Germany, having devastated so much of the Polish capital, now announces that she will "rebuild Warsaw and make it a modern city." Behind this statement lurks the inference that Warsaw was in need of demolition and that no steps had been taken to bring the buildings of that city in line with modern architectural progress. This suggestion is entirely false, for during the past few years new and impressive buildings of the type shown in the accompanying photograph had been erected not only in Warsaw



but in many of the other large Polish towns also; and all who are in a position to know pay tribute to the tremendous progress which had been made in so short a time by the Polish people themselves.

It is of particular interest to note also how worthily gas was playing its part in the new Warsaw before "Kultur" laid it low. Richmonds Gas Stove Co., Ltd. (Radiation, Ltd.), had shipped gas equipment for dozens of these new buildings of ultra modern design in which many hundreds of "New World" domestic cookers and heavy service ranges, together with other gas appliances from the same source, were in daily use. Not only does this apply to Warsaw but to other large Polish towns such as Lodz, Cracow, &c.

To mention only a few, we are able to state that the following modern State and Public Buildings were equipped with large Gas-heated cooking apparatus of almost every type—all manufactured here and sent direct from Richmonds' Warrington Works to Poland:

Bank of Poland.
Ministry of Railways.
Ministry of Education.
Ministry of Public Works.
University Hospital, Warsaw.
St. John's Hospital, Lodz.
District Law Courts, Lodz.
Town Hall, Lodz.
State Spirit Distillery, Lwow.
State Spirit Distillery, Cracow.
Jewish Hospital for Children, Warsaw.
Hospital for Infectious Diseases, Radogoszoz, near Lodz.
State Banknote Printing Works, Warsaw.
High School of Agriculture.
Czecho-Slovakian Legation, Warsaw.
Protestant Hospital, Warsaw.
R.C. Servan's Association (Restaurant), Warsaw.

Richmonds' gas appliances were also installed in the premises of the following high Polish Officials as well as in hundreds of ordinary domestic dwellings: Marshal Pilsudski, the Minister of Posts and Telegraphs, General Slawoj Skladkiwski (Under Secretary for War and formerly Home Secretary), Monsieur Nakoniecznikoff-Klukowski (Minister of Agriculture), General Gorecki (President of the National Economic Bank and President of the Association of Polish Ex-Service Men), and Dr. Gruber (President of the Post Office Savings Bank).

That such property should be destroyed is one of the tragedies of this war, but whatever the future may hold for Warsaw, it seems safe to suggest that its regeneration will witness gas again playing an important part in the life of the City.

Financial Position of Edinburgh Gas Department as a Result of War

Mr. James Jamieson (Engineer and Manager of the Edinburgh Gas Department) has submitted the following report to his Committee on the financial position of the Gas Undertaking consequent upon the outbreak of hostilities.

When I submitted my final estimates for the year to May 28, 1940, they showed a surplus of £545. In spite, therefore, of increases in the costs of coal, labour, and material amounting in all to £80,000 since the price of gas was fixed at its present level, the question of increasing the price of gas did not even require to be considered. It remained at about 3d. per 1,000 cu.ft. below the level of 1914, although many other Undertakings have recently been forced to increase prices mainly as a result of the higher cost of coal.

According to results between May 28, 1939, and the outbreak of war this estimated surplus was likely to be exceeded because gas sold had increased in comparison with the previous year by 61 million cu.ft. or about 4%. With the outbreak of war the outlook has been completely changed. Since Sept. 3 the gas output has fallen by about 17% as a result of the elimination of public lighting, evacuation and rationing. Even allowing for the increase recorded in the early part of the year it is likely that the decrease for the whole year will be not less than 10%.

Overheads therefore must be spread over a smaller output. I have prepared another estimate on this basis, which, after allowing for the reduced expenditure on manufacture and reduced revenue from gas, shows a deficit of £19,000. This is assuming that items of revenue and expenditure, other than those mentioned will remain at about present levels. This, however, may not be the case. There are a number of items of both revenue and expenditure which may have an effect which it is at present difficult to estimate.

For instance, it has been necessary to put the waterless gasholder out of commission. This involves the use of more carbonizing plant and consequent higher carbonizing costs. There has been additional expenditure on A.R.P. works, standby emergency staff, watching and policing the works, and income tax will, of course, be higher than estimated. At a rough estimate these extra costs will amount to £30,000.

On the other hand, there has been a strong demand for coke, which should yield perhaps £10,000 more revenue, and there will be lower expenditure on service pipes and gasfitting work of, say, £15,000.

Taking all these factors into consideration it still seems certain that there will be a substantial loss on this year's working, and, of course, in future years as well, so long as output remains at the reduced figure.

Some increase in the price of gas is clearly necessary, but how much it is too early to say. I think it would be undesirable at this stage to decide upon an immediate increase especially in view of the already heavy burdens being laid upon most of our consumers. I would suggest that last year's carry forward of £11,000 with perhaps a small contribution from the reserve fund should be used to meet any deficit this year, and that the question of increasing the price in 1940-41 should be reconsidered when the provisional estimates are submitted in February next, by which time the results for the present year may be more easily forecast.

Cookery Demonstrations Attendances Exceed All Expectations

In spite of the international situation, the Dartmouth Gas Light and Coke Company decided to hold a series of Cookery Demonstrations in their Demonstration Kitchen, Clarence Street. These were given on three days towards the end of last month.

Miss R. Pullin, of the Radiation Research Kitchen, demonstrated how economical dishes and whole dinners could be cooked in a "New World" oven with a minimum consumption of gas. Attendances were larger than before the war, and the actual sales were about equal to those resulting from pre-war demonstrations.

New Gasholder at Loughborough

Loughborough's new 500,000 cu.ft. gasholder was formally handed over to the Corporation on Oct. 26 by Mr. Frank L. Wright, General Manager of Messrs. Westwood & Wright, Ltd., the contractors. The ceremony completed, the large scheme of reorganization of the entire Gas Undertaking, which supplies Hathern and Quorn, in addition to Loughborough, began five years ago.

Councillor George Read (Chairman of the Gas Committee) said that, when repairs to the old holder were completed, total storage would amount to over 1,000,000 cu.ft.

Mr. L. Ingram (Engineer and Manager) stated that the new holder was 90 ft. in diameter, and when fully inflated rose 110 ft. above ground.

Gas Undertakings Results

Dundee

The twelve months ended May 15 last resulted in a small decrease in the quantity of gas sold by the Corporation of Dundee Gas Department. The quantity made amounted to 1,965,271,104 cu.ft., which compares with 1,971,318,396 cu.ft. in 1937-38—a decrease of 6,047,292 cu.ft. The gas sold (inclusive of that used on works) amounted to 1,759,979,750 cu.ft., as against 1,775,375,295 cu.ft. in the preceding year—a decrease of 15,395,545 cu.ft. Gas unaccounted for amounted to 10.44% of the production, as compared with 9.94% during the previous year. Ordinary consumers accounted for 43.94% of the sales, prepayment consumers 42.64%, and industrial consumers 4.76%. At May 15 the total number of consumers was 58,083, as against 58,184 a year ago. The carburetted water gas made was increased from 511,379,064 cu.ft. to 601,181,522 cu.ft. The number of privately owned cookers continues to show a considerable increase. Six petrol-driven portable conveyors have been purchased, and have done very useful work in transporting coal from the store to the retort house, as well as coke, ashes, refuse, &c., from store to waggons. Two new 2 million cu.ft. capacity condensers have considerably improved the efficiency of the cooling plant, and work is proceeding on the construction of two electro-static detarrers and two static washers, each of 10 million cu.ft. per day capacity. During the year the outstanding loan debt was reduced to £278,760, equivalent to £142 per million cu.ft. of gas made. It has not been found necessary to make any change in the price of gas for the financial year 1939-40. Some anticipated reduction in the receipts from coke and tar is expected to be largely offset by a reduction in cost of renewals and reconstruction chargeable against revenue.

Stockport

The County Borough of Stockport Gas Department are in a position to report an increase in gas sold of 59,575,500 cu.ft. during the financial year to March 31, as compared with the preceding twelve months. While expenditure has been increased by the higher cost of coal which came into operation with the acceptance of new contracts, the revenue from the increased quantity of gas sold has been offset by a lower income from residual products—principally tar. Thus the trading profit is £55,327, as against £57,824 a year ago. After deducting interest and repayment of advances, and adding the balance brought forward from the previous year, there remains the sum of £25,684 to be allocated. The gas unaccounted for amounted in the past year to 2.13%. The number of consumers at March 31 was 52,472, an increase of 988 over the previous year. Of these, 31,505 are supplied through prepayment meters, and 20,967 through ordinary meters. The gas sold for industrial purposes during the year totalled 274,243,000 cu.ft., as compared with 244,050,700 cu.ft. last year—an increase of 30,192,300 cu.ft. On the subject of air raid precautions, it is stated that, in order to maintain emergency supplies of gas in the event of damage to the works, the distribution system has been connected at ten points with the mains of the Manchester Corporation. Special arrangements are being made to isolate portions of all the mains in the undertaking's area by the provision of bagging holes, at any of which stopping-off of the main can be effected.

World Power Conference

Sir Harold Hartley, C.B.E., F.R.S., the Chairman of the International Executive Council of the World Power Conference, has asked Mr. G. J. T. Bakker, the Chairman of the Netherlands National Committee, and First Vice-Chairman of the Council, to become Acting-Chairman during the war. Mr. Bakker has consented. The Central Office in London will be closed temporarily, and correspondence intended for the International Executive Council should be addressed to the Secretariat of the Netherlands National Committee:

The Secretariat, International Executive Council, World Power Conference, Vereeniging voor Congressen op Electrotechnisch en Aanverwant Gebied, Utrechtscheweg 210, Arnhem, Holland.

Correspondence for the British National Committee should, as at present, be addressed to 36, Kingsway, London, W.C.2. Arrangements have been made for such correspondence to be dealt with, although the office itself was closed as from Monday, Oct. 30, 1939.

Orders for any World Power Conference Transactions should be sent to:

Percy Lund, Humphries & Co., Ltd., The County Press, Bradford.

Orders for the publications of the Central Office of the World Power Conference, including the Statistical Year-book of the World Power Conference, should be directed to the British National Committee at the usual address.

Special arrangements have, however, been made with respect to "Technical Data on Fuel," the Fourth Edition, Second Impression of which was published by the British National Committee in 1937. In view of the increased sale of this important work, and in order to ensure its ready availability during the war, orders will be dealt with by:

Mr. M. W. Burt, Secretary, The Society of British Gas Industries, "Uplands," Epsom Road, Guildford, Surrey.

Gas Meter Testing in Glasgow

SUMMARY OF THE RESULTS OF TESTING.

	Stamped.	Rejected.	Percentage Rejected.
Total New Meters Tested	9,450	69	0.7%
Total Repaired Meters Tested	22,877	325	1.4%
Total Meters submitted for Certification	91	190	67.6%
Totals	32,418	584	—

ANALYSIS OF FAULTS AND ERRORS IN METERS REJECTED.

	More than 2% Fast.	More than 3% Slow.	Passing Gas without Registering.	Ceased to Register. (Bound.)	Leakage.	Undue Oscillation.	Excessive Absorption of Pressure.	Other Faults.	Total Rejected.
New...	40	21	2	1	—	1	1	3	69
Repaired	128	117	18	10	4	23	14	11	325
Submitted for Certification	123	32	5	3	1	17	1	8	190
Totals	291	170	25	14	5	41	16	22	584

The above summaries of the work of the Gas Meter Testing Department of the City of Glasgow are extracted from the annual report of the Chief Inspector for the year ended May 31. The fees amounted to £2,152 12s. 6d. compared with £2,247 9s. 0d. the previous year—a decrease of £94 16s. 6d. The number of meters tested—33,002—shows a drop of 1,582 on the previous year.

BRIGHTON UTILITIES POOL THEIR EMERGENCY SERVICES

On the instigation of the Brighton, Hove and Worthing Gas Company an effective system has been brought into operation, whereby the three public utility undertakings in the district—gas, electricity, and water—have pooled their resources in order to avoid duplication of effort in the operation of their A.R.P. emergency services

THE scheme for A.R.P. emergency services, organized jointly by the three public utility undertakings—gas, electricity, and water—in Brighton is of peculiar interest in that it is believed to be the only scheme of its kind in existence.

The idea emanated from a realization of the fact that a high-explosive bomb bursting in a public thoroughfare in almost any built-up area would, in the vast majority of cases, dislocate not just one, or even two, but probably *all* the utility services—gas, electricity, water, sewers, and telephones. At the same time it was recognized that under the generally adopted A.R.P. system the onus of notifying damage to services rests upon the shoulders of the local warden. Now such a scheme, from the public utility undertakings' point of view, has several very obvious drawbacks. In the general confusion caused by the bursting of high-explosive bombs the warden will clearly—and rightly—give priority to casualties and fires rather than probe into a large crater reeking of cordite and possibly rapidly filling with water in order to ascertain what mains are broken. Alternatively, flames from a severed gas main may be leaping out of the crater; but that does not indicate that electricity lines and sewers may not be damaged as well.

The probability is, therefore, that the warden—with all the goodwill in the world—will play for safety and report "All services damaged"; with the result that at least three emergency squads—gas, electricity, and water—may be rushed to the scene—including up to a score of men and a good deal of duplicated equipment. In exceptional circumstances the attendance of all three squads might be warranted; but it appears more than likely that much of the apparatus and personnel will be redundant—and consequently wasted. This is undesirable in any event, but more particularly so if there is other extensive damage in the district to be attended to.

Common Problems

Having all this in mind, the Gas Company approached the electricity and water undertakings, which are controlled by the Corporation, and suggested a detailed discussion of the position. It was pointed out that the three undertakings were so closely related as regards their areas; that they had common problems, and that their services in most instances ran so near to one another that it would be extremely difficult in an emergency to ascertain which had been damaged. The telephone authority was also invited to co-operate in the scheme, but the post office stated that the technicalities of the telephone system involved considerations of such an exceptional nature that they deemed it desirable to operate their emergency services independently.

The other three undertakings, however, decided to pool their resources, and so far as gas and electricity were concerned it was agreed that the exigencies of the moment demanded that they should "bury the hatchet" and co-operate in the interests of public safety. In this way they were conforming to the spirit of the notification which has since gone out from their respective National Bodies urging gas and electricity undertakings to refrain from every form of competition with one another during the war. Indeed, Mr. Browne observes that it may not be out of place to suggest that if any good can come out of so terrible a thing as war it may be the lasting elimination of cut-throat competition between undertakings who have worked together in a National emergency, and who in so doing have gained a true appreciation of each other's point of view and each other's problems.

Personnel Drawn from Three Services

The twelve utility emergency squads, identified by the letters RP/U (Repair Party—Utility) on their steel helmets, operate from three report centres, the crews of six consisting of men drawn from each of the three services. It is recognized that the bulk of the work of any emergency gang will be "labourers"—that is to say, the unskilled task of "getting down" to the mains with picks and shovels. Having uncovered and identified the damage, it is the job of the men from the undertaking concerned to take charge and direct repair operations. The same applies, of course, to uncovering a main some way back from the damage in order to seal it off. If it were a gas main, all members of the gang would lend a hand to excavate the soil, after which the members of the Gas Company would carry on with the bagging-off, assisted so far as necessary by the others. It is up to the individual undertakings to mobilize "specialist" squads if they think fit—to deal with serious emergencies which are known to concern their services alone. Such squads would normally be held in reserve.

On receipt of the air raid warning the personnel report to the centre to which they are attached. Transport drivers and key men are individually notified on receipt of air raid message—red by means of a bell in their bedrooms operated by a pressure-wave device. The drivers line up their lorries at the report centre, and as each crew is completed the main control room is advised to this effect by telephone. The crews then take cover in the shelters provided at each centre until called upon to take action.

We had the opportunity of inspecting the Gas Company's Church Street Depôt, which is the report centre for four "composite" crews and two "specialist" gas crews. All the protective clothing is hung neatly round the walls, with the number of crew above each group and the individual's name above each peg. In adjoining rooms is additional emergency equipment, such as picks, shovels, hurricane and spot lamps, gas main stoppers and bags of varying sizes, as well as "Novox" and other first-aid equipment. It may be mentioned in passing that the gas lights in this emergency depôt are effectively screened by special Wico "black-out" fittings—so that adequate lighting is available for the men to don their protective clothing.

Patrolling Inspectors

As we have indicated, the public utility undertakings came to the conclusion, without any reflection on the invaluable services of the air raid wardens, that only experts well versed in all phases of utility distribution systems and familiar with the problems involved, particularly the vulnerable points of each system, could be relied upon to provide completely trustworthy information regarding air raid damage to mains and services. Information, in other words, that could be instantly and confidently acted upon.

The whole area has therefore been divided up into 46 separate districts with what is known as a "patrolling inspector" to each. These inspectors are recruited from the staff of the three utility undertakings in proportions roughly relative to the total personnel employed; no matter by which undertaking they are employed, however, they are thoroughly *au fait* with the distribution systems of the others, with full knowledge of the danger points in each, while they have all attended the same lectures, as also have the men in the emergency crews. On receipt of the aid raid warning these men begin to patrol their districts just like any ordinary air raid warden; but before doing so they get in touch with the main control room by telephone and by means of a code word which identifies them confirm that they are on duty. The control room is thus able to ascertain very quickly if any particular district is for some reason or other not covered, and they can take steps to remedy it.

The Utilities Bureau

Attached to the main A.R.P. control room in Brighton is what is termed the Utilities Bureau. This acts as the control room for the utilities and is permanently manned by representatives of the three services. Here there are large-scale maps of the area showing the positions of mains, &c., together with boards and pegs to indicate at a glance the position and movements of any of the twelve emergency crews. Direct telephone lines connect the Bureau with the headquarters of all three services.

Notification of air raid damage to mains is given by the patrolling inspectors to the Utilities Bureau. A bridging switch in the Bureau enables the inspector to be connected via the trunk

lines to the three utility headquarters, so that responsible officials of each service, as well as those at the Bureau, can discuss with each other and the inspector what steps should be taken. On reaching a decision, the Bureau 'phones the "action call" through to the appropriate report centre on the district. Should notification of poison gas or roads blocked have been received in the meantime from the A.R.P. district wardens, this information will be handed into the Utilities Bureau from the main control room and passed on to the squads concerned. A service of messengers is, of course, immediately available in the event of telephone communications being interrupted. The Gas Company have their own decontamination centre at Black Rock, but the two municipal centres are also available for the use of the emergency crews.

Recent tests have shown this scheme to be thoroughly effective and reliable, while it has also eliminated considerable duplication of equipment and personnel.

Low-Pressure Gas for Motor Transport

A Gas Light and Coke Company Lorry converted to the use of gas fuel. The duplicate bag arrangement can be seen from the photograph on the left

IN view of the number of enquiries received by the Gas Light and Coke Company regarding the use of gas for transport, an invitation was sent to leading automobile engineers on the Company's area of supply to visit Watson House in order to examine one of the Company's lorries which had been converted from petrol to gas using the fabric bag method. The meeting was held on Tuesday, Oct. 24, and between 65 and 70 automobile engineers were present. In addition to the Gas Light & Coke Company's lorry, a small van which had been converted by the South Metropolitan Gas Company was on view so that those present could see how the conversions could be carried out on large and small vehicles. Details of the two types of carburetters used were explained by Mr. Inman, of the Gas Light & Coke Company, and Mr. Waight, of the South Metropolitan Gas Company.

The gas bag method for motor transport is cumbersome, but simple. It is practicable only for short journeys and for vans and lorries up to 2 tons. In the case of the Gas Light and Coke Company's van illustrated, instead of having one large bag on top of the van, the overall height has been reduced by utilizing the upper part of the van to take a 12 in. bag. The arrangement can be seen from the end view of the van.

It has been found that approximately 250 cu.ft. of 500 C.V. gas is equivalent to one gallon of petrol. This quantity of gas, it was explained, would normally be carried in a bag 10 ft. long by 5 ft. wide by 5 ft. high. The cruising range of the lorry would, of course, be limited, and obviously a bag of the largest size practicable should be fitted.

No Special Apparatus for Filling

For filling the bags no special apparatus is required, and a method for measuring the gas was described in last week's "JOURNAL." The importance was mentioned of taking the supply pipe from the bag to the carburetter from the back of the bag. Whether this is made by a direct connexion to the back of the bag or by a connexion to the front of the bag with a pipe running inside the bag is a matter of convenience. The size of pipe will depend on the horse-power of the engine. For example, a 15 h.p. engine will require a pipe of approximately 1¼ in. internal diameter. It is advisable to fix a standard gas cock so that the supply of gas from the bag can be controlled should the carburetter have to be removed for any reason.

It was explained that several suitable carburetters are on the market, all of which automatically shut off the supply of gas immediately the engine stops. It was suggested that the petrol carburetter and supply should be left in position, and if no petrol cock is fitted to the supply one should be fitted so that the petrol can be turned off when the gas is being used. The gas carburetter can be fitted between the existing carburetter and the manifold by using a special casting, or an additional carburetter point can be drilled in the manifold to take the gas carburetter. In some cases it has been found possible to fit the gas carburetter between the throttle position and the petrol carburetter body so that the same throttle arrangement can be used, the necessary adjustment being made to the air inlet to the petrol carburetter when gas is being used. It is possible to connect the gas carburetter to the foot control and this is to be recommended, but in some cases arrangements have been made for the petrol carburetter to remain on the foot control, the gas carburetter being operated by a Bowden wire control from the driving position.

A recent test has been carried out on a 15 h.p. van with a 1½ ton load. The capacity of the bag fitted was 250 cu.ft. and the distance travelled was 17.4 miles. There was no difficulty in obtaining 30 miles per hour and the various hills were taken with ease. This test was carried out by Messrs. Grant & West, Ltd., using a G.L.C. carburetter.

After the visitors had examined the two vehicles and the standpipe arrangement, they adjourned to the Watson House Library.

Mr. Dieterichs introduced Mr. Michael Milne-Watson, the Assistant Controller of Gas Sales, and Mr. C. A. Masterman, the Chief Technical Officer, to the meeting and went on to explain the Company's position in relation to the motor trade.

No Competition with Motor Trade

He mentioned that some of the automobile engineers had suggested to him that they had heard that the gas undertakings would be carrying out the conversions, and he assured all present that, as far as the Gas Light & Coke Company were concerned, he was quite certain that the Management had no intention of competing with the motor trade in this respect, and further, although, as most of them knew, the Gas Light & Coke Company had designed a carburetter suitable for conversions which was now being marketed by Messrs. Grant & West, Ltd., there was no obligation on the part of any automobile engineer to whom they sent enquiries to use this carburetter. He pointed out that well-designed gas carburetters were available from several makers, and providing the automobile engineers were satisfied with the carburetter there was every reason why they should use the type

which they preferred. He did, however, make it quite clear that there were carburetters on the market which were inclined to be rather extravagant as far as fuel was concerned, and when the amount of fuel carried was so limited the most efficient carburetter should be used, and in this direction a considerable amount of research was being done.

Mr. Dieterichs mentioned that there were a number of bag manufacturers present and he was hoping that these manufacturers would leave the work of fitting the bags and making adjustment to the car or van to the automobile engineers. He stated that he felt this to be the legitimate work of such concerns, and the Gas Light & Coke Company would refer their consumers to the automobile engineers rather than the bag manufacturers.

Continuing, Mr. Dieterichs said that he knew discussions were taking place between the Motor Agents' Association and the London gas undertakings with regard to standpipes, and it was considered that the selling of the fuel was really the business of the petrol stations, and the London gas undertakings did not wish to compete in this field. It was, therefore, hoped that standpipes would be fitted at the petrol filling stations, which were more conveniently laid out and were in better positions than the gas company premises for filling bags. He suggested that automobile engineers who were considering taking on the work of fitting bags to cars should make application to the Gas Light & Coke Company for standpipes as soon as possible, because obviously they would require a standpipe for testing the cars out after the bags had been fitted.

Need for Standardization

One point he made clear was the need for the standardization of the filling point attached to the gas bag, not only in London, but throughout the country, and although at present most bag makers were using a standard 2 in. B.S.P. thread connexion special designs had been submitted to him by various automobile engineers, but the one which looked most promising was one designed by Mr. Dean Chandler, of the South Metropolitan Gas Company. He could not say definitely whether this would be the standard fitting, as the decision would be left to the Industrial Gas Centres

Visitors at the Demonstration. On the left can be seen the small van converted by the South Metropolitan Gas Company

Committee, but as soon as their decision had been reached, arrangements would be made for the mass production of these fittings so that automobile engineers and bag makers would be able to obtain them without difficulty. He also mentioned that as soon as the design had been approved, the drawings would be given to a number of manufacturers so that they could be ordered from various sources.

Mr. Dieterichs also showed samples of a flexible tube which he considered was quite satisfactory for use between the bag connexion and the bag filling point, and the standpipe and the filling point, the particular sample being made by Compoflex, Ltd.

Mr. Wintour (Messrs. W. R. Wintour, Ltd.) said he was very interested in all he had seen, but one of the most important points was the arrangements which were being made by the gas undertakings for filling the bags, and mentioned that although most bag makers and automobile engineers were doing their part it was most important that standpipes should appear with as little delay as possible, and he would like to know what was the proposed charge to be made for gas and whether any definite arrangements had been made. He also asked whether any charge would be made to the petrol stations for the installation of standpipes.

Mr. Milne-Watson stated that the London gas undertakings had met the Motor Agents' Association and discussions had taken place, and as negotiations were still taking place it would be rather premature for him to make any definite statement at the present moment, but the matter would be dealt with as quickly as possible.

Mr. Cooke (Messrs. Grant & West, Ltd.) mentioned that he was receiving a considerable number of enquiries and gave the following results of tests which had been carried out on a van using a G.L.C. carburetter, the tests being carried out by Messrs. P. Winn (Barking), Ltd.

Test No. 1, *Oct.* 6, 1939

Childerditch to Barking. Strong head wind—open country most of journey. Load 1 ton 19 cwt. of scrap iron. Gas consumption 14.8 miles on 250 cu.ft. of gas. Maximum speed with load—25 miles per hour; all hills taken in third gear. The best performance was possible when the bag was half empty.

Test No. 2, *Oct.* 7, 1939

Barking to Childerditch. Weather good. No load. Maximum speed 30 miles per hour. Gas consumption 16.9 miles on 245 cu.ft. of gas.

Test No. 3, *Oct.* 11, 1939

Barking to Childerditch. Load 4 men with tools—head wind. Consumption 17.5 miles on 250 cu.ft. of gas.

Test No. 4, *Oct.* 11, 1939

Barking to Childerditch. No load and part way back with 4 men and tools. Slight head wind on outward journey—gas consumption 19.1 miles on 250 cu.ft.

Test No. 5, *Oct.* 12, 1939

Barking to Marble Arch, London, W. (through City and traffic). Load 27 cwt. sandbags. Gas consumption 15.8 miles on 250 cu.ft. of gas.

Test No. 6, *Oct.* 13, 1939

Barking to Romford and back. No load—weather fair. Gas consumption 18.8 miles on 250 cu.ft. of gas. Top gear performance excellent.

Test No. 7, *Oct.* 13, 1939

Barking—Canning Town—East Ham—Barking. Load 2 tons glazed tiles (overload). 10 miles on 175 cu.ft. of gas. Engine pulled very well on top gear at 19 to 25 miles per hour. This lorry is fitted with a 4-speed gear box and the engine had sufficient power to start from standstill in second gear.

Provision of Standpipes

With regard to the question of providing standpipes, Mr. King (Hyde Park Garages) suggested that if there was any difficulty with regard to meters, the capacity of the bag was known and a charge could be made according to the capacity of the bag.

Mr. Garrud (the Gas Light & Coke Company) pointed out that in some cases the bags would arrive partly filled and it would be very difficult to estimate how much gas had been put into the bag, but what was also important was that the gas undertaking had to charge the garage proprietor and without a meter there would be no record of how much gas had been supplied over a given period.

Another member asked for the possible cost of the standpipe and metering arrangements and whether it would be possible to hire the meter.

Mr. Dieterichs stated that he could not reply to this question as it was a matter which was under discussion and one which the individual undertakings would have to decide, although in London it was hoped to have a common policy, both with regard to standpipes and the price of gas.

In conclusion, Mr. Dieterichs mentioned that the Industrial Gas Centres Committee, who would be dealing with this matter throughout the country, would be holding a meeting shortly, and it was hoped that arrangements could be made for a special committee to be formed consisting of representatives of the Gas Industry, the Institution of Automobile Engineers, and the bag makers, so that the sizes of bags could be standardized for given types of vehicles and particulars made available to automobile engineers, as it would only complicate matters and make the bags more expensive if each automobile engineer ordered bags of different sizes, probably varying only by inches.

Mr. Masterman asked how many would realize that if gas were used to replace all petrol for motor vehicles, the demand for gas for that purpose alone would exceed the present total production of gas of the Industry. He stated that the full rate of delivery of a single petrol pump was such as to correspond to the total capacity in terms of gas of a 36 in. diameter main, and added that such mains were few and far between and normally are looked upon as main arteries for the supply to a whole district. Thus to obtain a sufficient flow of gas to allow fitting time to be reduced, even to 10 minutes per equivalent gallon, meant that care must be taken as to where standpipes were erected to ensure that they did not starve the mains to which they were connected.

How Gas Undertakings Can Help the Steel Industry

The Iron and Steel Control Department of the Ministry of Supply has appealed to the Gas Industry to render a further vital national service by augmenting the country's supplies of scrap iron and steel and ensuring that these become available to the steelworks at the earliest possible moment. The scrap merchants are ready to handle the business, and the Ministry is prepared to make special arrangements to meet exceptional circumstances outside the scope of the merchants' activities.

THE Gas Industry as a whole handles the problem of disposing of its scrap metals with the same efficiency as it exercises in other spheres of business; but there are exceptions, particularly in the smaller and more remote undertakings, and the present crisis calls for a careful examination of the position not only from the point of view of national necessity but also on the ground of sensible economy. In calling upon gas companies, municipal undertakings, and gas fittings, meter and stove manufacturers to consider the special importance of making scrap metal available for the steelworks the Iron and Steel Control Department of the Ministry of Supply states that many factories and commercial premises contain such items as discarded machines, machine parts, old steel pulleys, shafts, broken tools, disused piping, metal sheeting, unwanted dies, jigs and old metal containers, which can now be put to national use. It will be appreciated, the circular points out, that while, in the national interest, prices to the final consumer are controlled, these bear no relation to the price of scrap at its source, as transport and preparatory operations are necessary before the metal is delivered in suitable form to the steelworks.

The Department points out in a general note issued to the Technical Press that since over half the total weight of materials charged into British steel furnaces consists of scrap, it is clear that the efficient salvage of old iron and steel is a national duty, especially in time of war. From the point of view of the steel makers "scrap" represents any kind of ferrous metal which can be remelted and rejuvenated into new steel. The great bulk of the heavier types of scrap is remelted with a proportion of pig iron in open hearth furnaces to produce acid and basic steel. Considerable tonnages are used in electric furnaces. Light and miscellaneous material, normally baled, is sometimes charged into blast furnaces to increase the output of pig iron. Scrap cast iron is used almost exactly like pig iron in steel melting shops and in foundries.

Main Categories of Scraps

From a commercial standpoint, scrap may be divided into several main categories. There is the "process" or "circulating" scrap produced by the steel industry itself as it works the cast steel ingot into finished products. There is the "new" or "producers" scrap returned in very large tonnages by the iron and steel metal working trades in the form of croppings, shearings, short lengths, ends and so on.

Next comes the "obsolete" or "demolition" scrap produced by ship-breakers and dismantlers. The constant renewal of the country's industrial equipment is a prolific source of scrap material, witness the accumulation of old iron and steel in the developing areas of the United States. In this group may be placed the written-off plant and discarded machinery, representing the outthrow of an endless process of obsolescence and renewal in factories, work-shops and yards.

Further down the list is the "refuse" or "destructor" scrap recovered by those local authorities which practice salvage, rather than pure and simple dumping. Some local bodies systematically segregate the scrap metal in their refuse, extracting metallic material before incineration. This is sold for the benefit of the local rates. Tacked on to this category in respect of quality, is the light and very heterogeneous scrap collected by itinerant dealers from farms and dwelling-houses. Some districts are combed very thoroughly by these travelling junk merchants, but other areas are hardly touched in normal times, for the short and simple reason that the value of the material garnered in, cannot stand high collection costs. Touching on steel and iron works' "process" scrap this is merely "circulated" back to the melting furnaces from the casting pits, rolling mills, foundries and fabricating departments.

Some of the "producers" scrap accumulated in the metal working trades is bought direct by the steel firms. This material being "new" and clean, and requiring the minimum of sorting, its value can be easily assessed. At the same time, the regular return of scrap establishes credits which can be set against purchases of new steel. A big part of the commerce in "producers" scrap is, however, in the hands of scrap iron and steel merchants. These make up a body of four or five hundred merchant firms who often combine dealings in scrap with business in iron and steel products, iron ore, refractories, alloys and works' supplies. Prominent in the work of the merchant system is the combination of small quantities into sizeable tonnages for delivery to the melting shops, and the assortment of the collected material into the numerous grades suitable for the different requirements of the iron and steel industry. Many of the bigger merchant concerns also act as ship breakers and factory dismantlers. "Refuse" or "destructor" scrap is usually handled by merchants.

The last group of light, miscellaneous scrap is the most difficult of all to collect, grade, and handle, mainly for the reason that the available deposits are small, scattered, and of uncertain quality. To obtain paying loads, metallic debris has generally to be combined with waste products like paper, bottles, bones, rags and the like.

Great Annual Turnover

Very large tonnages of scrap are used by the British steel trade each year, apart altogether from the more specialized material consumed by steel and iron founders and by wrought iron makers. In 1937, a representative year, about 7¼ million tons of scrap were melted in turning out the 13 million tons of steel ingots produced in this country. Of the tonnage melted, some 2,850,000 tons of scrap steel and 226,000 tons of scrap cast iron were supplied by the steel works themselves. The cast iron for the most part came from broken-up moulds. About 4,034,000 tons of scrap steel and 367,000 tons of scrap cast iron were bought from outside sources. Taking an average value of £3 per ton, in round figures, the turnover of purchased scrap would thus be near £13 millions a year.

The proportion of scrap used in furnace charges varies greatly from time to time, and from district to district. This depends on the convenience of bulk scrap supplies, the nature of the steel-making practice and the relative price of scrap and pig iron. Before the last war the average percentage used in the British steel trade was about 30%, with some areas as low as 10%. The general proportion was greatly increased during the war to about 60%, at which level it remained during most of the post-Great War period. Normal present-day practice varies from about 75% in Sheffield to around 25% in Lincolnshire. The latter district purchases little or no scrap, but uses up its own "process" waste. At present the average percentage, figured on a national basis, is somewhat less than the recent normal, due to a movement towards the greater use of pig iron.

In normal times, the steel trade is able to meet all its scrap needs from home sources, supported by bulk purchases made abroad when the market is favourable. Under present conditions it is obvious that as much home material as possible should be salvaged and used, even from sources not very thoroughly tapped in ordinary circumstances. This will cut dependence on foreign imports, reduce the risk of sea transport, save on foreign exchange and economise our strategic reserves.

It can be taken for granted that the steel works will save and use their own "process" scrap with extreme care. This also applies to suppliers of "producers" scrap, as they will be anxious to convert waste material into cost credits without loss of time, more especially since scrap prices are now controlled by Statutory Order, and no appreciation in values will be gained by holding. Ship breaking will probably recede to vanishing proportions, but the re-orientation of the country's industries should accelerate the dismantling of obsolete structures. The systematic removal of obsolete plant and structures as well as the thorough clearing out of scrap in general industry is, no doubt, open to greater stimulus on the ground of national interest. Any increase in the rate of disposal or any widening of the normal areas of collection will contribute appreciable tonnages to the long-term inventory of essential war materials.

The Problem of the Smaller Undertaking

The majority of the undertakings and manufacturing companies to whom the Ministry's appeal has been addressed are already pretty well organized, especially the municipalities, but it is realized that some of the smaller bodies may find it difficult to collect and sell their scrap metals to proper advantage. With the circular the Department sent out reply cards and from these, which

are being received at the rate of hundreds per day, much useful information is being gathered about the scrap situation generally, and the Department will welcome any further expression of views the Industry can usefully contribute. It is intended to put every producer of scrap in touch with reputable scrap merchants whose depots are most conveniently situated for dealing with their output. It is anticipated that there may be some cases where the works are too far removed or the class of scrap is unsuitable for particular merchants, and for these circumstances special arrangements will be made so that every available ounce of metal may be made available for re-use.

Up and down the country, more particularly in out of the way places where collections at regular intervals have hitherto been regarded as impracticable, one sees works yards filled with "junk"—old pipes, mains, &c.—which might be turned to good account if only some means could be found for collecting it and conveying it to the steelworks.

At the other end of the scale there are, as "A Scrap Merchant" pointed out in an article in the "JOURNAL" of Dec. 21, 1938, concerns which issue tenders at regular intervals for the purchase of their scrap which has been carefully sorted and classified, and which can be confidently purchased by the scrap trader. Indeed, many dealers buy from them without inspection, for the qualities are regular and vary very little from time to time. Such companies naturally receive the highest prices and the best possible service in the disposal of their scrap because they attract competition from the reputable merchants who are eager to place their service and organization at the command of those who appreciate it and know best how to profit by it. We are told that the Gas Light and Coke Company enters into scrap disposal contracts for three months at a time, during which period the successful tenderer takes all the scrap produced at any particular works.

The same writer remarked that some gas undertakings were deplorably casual, not to say wasteful. It was as if once they had decided that any plant was only fit for the scrap heap it was merely a waste of time to worry their heads about it and give serious consideration to the problems of disposal. In many companies scrap is collected haphazard by a number of dealers, and the full value is not received by the seller.

Manufacturers' Scrap

Most of the manufacturers of gas fittings and appliances already have satisfactory arrangements for disposal, either in stipulated quantities or at fixed intervals. Usually the scrap is much too valuable to be wasted and pressure on storage space too great to permit of large accumulations. Typical practice is for the scrap to be placed in appropriate bins, which are collected, weighed and paid for by the merchants at appointed times. There are, however, innumerable small factories which do not produce enough scrap to make a contract worth while, but the Ministry's new campaign visualizes some new arrangement whereby even these small quantities may be added to the national store.

A merchant who has lately completed a contract for dismantling a set of cast-iron scrubbers about 80 years old tells us that the merchants generally are willing to co-operate with the Gas Industry in devising the most efficient way of placing its scrap at the disposal of the steel makers. Generally speaking, he finds the Industry fully alive to the importance of scrap metal, but it is the exceptions who need to be convinced. Every bit of scrap is vitally necessary to-day, and it is not merely a case of the merchants "wanting" it, but of the steelworks crying out for it.

Thousands of black cookers of the pre-enamel era which would normally be passing out of domestic use into the hands of the merchants are being diverted into use either in Army canteens or in evacuation billets, and contracts which were entered into before the war between gas companies and scrap merchants for the breaking up of these cookers have been suspended for the duration of hostilities.

Overseas Statistics

The Gas Industry in Australia and New Zealand

THERE is always with us in this country a feeling that we would like to hear more of how the Industry is faring in the Dominions overseas. It is true that the majority of the undertakings in both Australia and New Zealand are small, but news from them need be none the less welcome on that account. In fact, success or failure in a small works may well provide lessons as helpful to the Industry at large as the experiences of their "bigger brothers"; and there is frequently, in the case of the little works, a story to be told of difficulties triumphantly surmounted which could not fail to be a source of inspiration to others similarly situated—or even to those more fortunately placed.

Let it be understood quite clearly that what we would like is to hear *more* of the doings of our far-away colleagues. Already we hear quite a lot. The technical "Transactions" of the Industry have been enriched, and will doubtless in the future be still further enriched, by contributions from the Dominions, examples of which will immediately occur to every reader. While various gas undertakings favour us with copies for editorial notice of their annual or half-yearly reports and accounts, the picture which we are enabled to draw is by no means complete, and it is just the opportunity of filling-in some of these blanks that would be welcomed. In making these remarks, it is no more than fitting to acknowledge with gratitude the essential help that is rendered to us annually in compiling the very full lists of overseas undertakings, officials, makes, &c., which are to be found in the "GAS JOURNAL" Calendar and Directory. This is valuable assistance, but we should like to have it supplemented on more frequent occasions during the year.

An Extended Statistical Record

Having said so much, let us confess frankly that we have been straying somewhat from the task upon which we set out—which was to acknowledge the receipt from the National Gas Association of Australia of a copy of "Statistics of the Gas Industry in Australia and New Zealand, 1937," compiled by the Association's Statistical Department. The compilation is an achievement upon which the Association are deserving of congratulation, and it constitutes a departure from what has been done previously in this direction. Hitherto statistical records have been produced almost entirely through the enterprise and generosity of the Australian Gas Light Company, "to whom," as the National Gas Association remark, "the Industry owes a debt of gratitude" for having pioneered this activity. The importance of an adequate statistical survey of an industry being granted, it follows that the Statistical Committee of the Association should command 100% support in the invaluable work they are doing. It is hoped, therefore, that in future all gas undertakings in Australia and New Zealand will supply the information asked for, and so make the record an absolutely complete one. In the present compilation, owing to the absence of statistical information from some gas undertakings, and in order to make the records as complete as possible, it has been necessary to introduce a method to enable the information received to be converted to a 100% basis.

Progress Over a Period

As a preface to the wealth of data reproduced, a list is given of the undertakings grouped according to gas make. Of the 101 in Australia (25 of which belong to the Colonial Gas Association, and nine to the Gas Supply Company), five had an annual make in 1937 of 500 million cu.ft. or over, while at the other end of the scale 38 had a make of under 10 millions, and 47 ranged between 10 and 99 millions. New Zealand undertakings, for the same year, included two with a make of 500 million cu.ft. and over; while of the total of 46 undertakings, 17 were under the 10 millions mark, and 22 between that and 99 millions. In the statistics, comparisons are made of 1937 with the years 1936 and 1930. The total number of meters in commission in Australia are shown as: 1930, 741,000; 1936, 795,000; and 1937, 822,000. These figures have been converted to 100% on data supplied by undertakings representing 95% of gas made in metropolitan areas, and 56% of gas made in provincial areas. Throughout the compilation, "metropolitan areas" mean the areas of the capital cities supplied by gas undertakings therein; while "provincial areas" mean the areas in the respective States, excluding metropolitan. As no information has been supplied, the provincial areas of Western Australia and South Australia are not shown in the tables.

The total quantity of coal carbonized in Australia is given as 1,188,000 tons in 1930, 1,090,000 tons in 1936, and 1,125,000 tons in 1937. In 1930 there was one company in New South Wales operating on an illuminating power standard of 18 candles, while in 1937 there was another in Queensland working to a standard of 16 candles. This is but an indication of the wealth of information furnished, which must be of inestimable value to students, and which will be of even greater use when every undertaking makes a point of sending in to the Association the whole of the figures asked for. Such compliance would be no more than an appropriate acknowledgment of the vast amount of trouble that has been taken by the Statistical Committee of the National Gas Association of Australia—and, it should be added, of the quite considerable expense that must have been incurred in the preparation of some 60 pages of tabular matter, which is a costly form of printing. In most cases it is possible to gain incentive from a careful study of what "the other fellow" is doing; and these figures afford ample scope for the creation of desirable standards.

Wales and Monmouthshire Association Stage Big Meeting in Cardiff

Though circumstances compelled the cancellation of arrangements for the customary September meeting at Porthcawl, it was felt by the Council of the Wales and Monmouthshire Association of Gas Engineers and Managers that it would be best to continue with the work of the Association as far as possible, and so a General Meeting was fixed to take place at the South Wales Institute of Engineers, Cardiff, on Thursday, Oct. 26. This was a decision which both attendance and enthusiasm justified to the full.

Mr. J. H. CANNING (Newport), the outgoing President, called the meeting to order, and said that, before proceeding with the business, he would like, on behalf of those present, to extend a very hearty welcome to Mr. George Dixon, of Nottingham, the President of The Institution of Gas Engineers, and to tell him how much they appreciated his presence, particularly at a time when travelling about was not easy. They all hoped he would have a happy and successful year of office, in spite of the difficult times. They were also honoured by having with them Col. W. Moncrieff Carr (Managing Director of the United Kingdom Gas Corporation), who was a Past-President of the Institution.

Mr. DIXON declared that he had come at no personal inconvenience, but with a great amount of pleasure. When the Institution met in Cardiff some ten or eleven years ago, under the Presidency of Mr. Madden, both he and his wife had been so attracted by the city that they determined to return at the first opportunity.

Col. CARR said he was there because, like all who were present, he was interested in the success of the Gas Industry in South Wales. He was specially pleased to be with them on this occasion because when, a few years ago, he was President of The Institution of Gas Engineers, he was unfortunately prevented by illness from attending a meeting of the Association during his year of office, and this was the first opportunity he had had of being with them. He was particularly glad to be at this meeting because they were going to elect as President a very esteemed friend and co-Director of his, Mr. Prosser Jones.

Mr. CANNING remarked that it had been a great disappointment to them all to have to cancel the arrangements for the two-days' meeting at Porthcawl. The Council, however, decided that under no conditions should the business activities of the Association be suspended during this disturbed period, whatever the difficulties might be. Consequently, this meeting was arranged, and the very substantial attendance showed the approval of the members.

Protective Measures for Gas Undertakings.

At the September meeting there were to have been two Papers presented, one of them by Mr. J. Harold Williams, of Cardiff, entitled "Protective Measures for Gas Undertakings against a National Emergency."

Mr. CANNING pointed out that this Paper was prepared prior to the war, and although it would not be discussed at the present meeting, permission had been given for its publication in the Technical Press, and arrangements made for it to be circulated to all members, because it was considered that it formed a most valuable summary of the various precautions to be taken against air raids. He was sure it would prove useful to every member, and he proposed that a hearty vote of thanks be given to Mr. Williams for the great pains taken by him in the preparation of the Paper. He did not appear to have missed a single point, and the knowledge which he had shown of his subject was remarkable.

Mr. E. ABLETT (Swansea), seconding, said the Paper was of particular merit in that it was, he believed, the first of its kind to figure in the proceedings of the Gas Industry.

(Mr. Williams's Paper will be found in the "JOURNAL" for Oct. 4, pp. 24-36.)

New Members.

The ASSISTANT HON. SECRETARY (Mr. Wilfrid Jones, Cardiff) having summarized the minutes of the last meeting, the following new members were elected, on the proposition of Mr. T. WILKINSON (Abercarn), seconded by Mr. J. F. RUST (Newport):

G. Beech (Engineer and Secretary, Quaker's Yard Gas and Water Company).
D. Emrys West (Engineer and Manager, Porthcawl Urban District Council Gas Department).
J. Powdrill (Engineer and General Manager, Pontypool Gas and Water Company).

Presidential Duties.

Mr. CANNING said it was now his pleasure to introduce the incoming President, Mr. J. Prosser Jones, who was well known to many of them for his work in connexion with the Rhymney and Aber Gas Company, where he had been General Manager for some twenty years. He had now retired from this position, but was still continuing his connexion with the Gas Industry, because he held Directorships under the United Kingdom Gas Corporation. He had been a member of the Association for 28 years, and they were all sure that he would make a most efficient President.

Mr. PROSSER JONES, on taking the chair, proposed a hearty vote of thanks to the retiring President. In addition to having been President on three occasions—in 1910, 1920, and last year—Mr. Canning had held the office of Treasurer for a long period. During the past year he had severed his connexion with the Newport Gas Company as Engineer and Manager, which he had held for many years, and the fact that his Directors had honoured him with a seat on the Board was conclusive evidence of their good opinion of him. He also held a prominent position in the public life of Newport, which was further proof of his popularity.

Mr. R. J. AUCKLAND (Cardiff), seconding, said that to know Mr. Canning was to respect him. In fact, the better one knew him the more one learned to revere his character and his qualities. (Applause.)

Mr. CANNING was then presented with a salver as a memento of his year of office, and in his acknowledgment thanked the Council, the Assistant Secretary, and the members for the loyal way in which they had supported him.

On the proposition of the PRESIDENT, seconded by Mr. I. G. JENKINS (Cardiff), Mr. Canning was appointed to be the representative of the Association on the Council of The Institution of Gas Engineers for the three years following May, 1940, when Mr. W. H. Johns' term expires. Mr. Johns was cordially thanked for his services.

Octavius Thomas Memorial Fund

Mr. CANNING, as Treasurer, reported on the progress of this fund, which at the moment amounted to about £170. The original intention was to invest the fund, and to apply the interest to an object which the late Mr. Thomas had very much at heart—the Benevolent Fund of The Institution; but subsequently it was suggested that some portion of the money should be devoted to the encouragement of the juniors—another object very dear to Mr. Thomas. It was, however, felt by the Council that the amount subscribed would not be sufficient to cover both objects, and they proposed that the fund be supplemented by a grant of £50 from the funds of the Special Purposes Section, and of £50 from the funds of the Association. In each case there was an ample balance to meet this supplementary grant. With regard to the application of the augmented fund, the Council would be glad to have suggestions. One suggestion was an Octavius Thomas Medal to be awarded to the junior reading the Paper adjudged to be of the highest merit during the preceding twelve months.

It was agreed, on the proposition of the PRESIDENT,

seconded by Mr. JOHNS, that the fund be supplemented by the two grants of £50.

Mr. DIXON, at the invitation of the President, next presented the certificates and prizes for examination successes and for work done for the Junior Gas Association. He said they were proud to see some of the boys present in their uniforms. (Applause.) It must be a great encouragement to the juniors to be able to feel that their efforts were appreciated, and that people were anxious to see them prosper in their work.

The recipients were: F. Stuart Johns (Swansea); N. H. Greenway (Cardiff); K. Muir (Cardiff); S. G. Meade (Newport); T. Cavanagh (Cardiff); T. J. Price (Newport); C. G. Llewellyn (Pontypool); G. Fieldhouse (Abertillery); B. R. Isitt (Newport); Ivor Bishop (Barry); Brinley Knill (Barry); R. L. Wagstaffe (Barry); J. P. Williams (Cardiff); E. J. Jones (Barry); Paul Stephens (Cardiff); S. J. Morris (Neath); G. Taylor (Barry); W. J. Jones (Neath); C. J. Bache (Cardiff); R. C. Merrett (Cardiff); D. E. Higgins (Cardiff); F. J. Loyns (Barry); B. G. Western (Cardiff); A. D. J. Lewis (Cardiff); W. S. Llewellyn (Cardiff); R. J. Perry (Cardiff); C. R. C. Bielski (Cardiff); Douglas Muir (Pontypridd); Gordon Osborne (Cardiff); R. A. Muir (Pontypridd); C. B. Jones (Neath); H. T. Maycock (Abertillery); A. S. Bell (Cardiff); and K. M. Ernest.

Mr. H. D. MADDEN, proposing a vote of thanks to Mr. Dixon, remarked that the idea of giving these prizes originated with Mr. Octavius Thomas.

Special Purposes Section.

The 29th annual report of the Special Purposes Section stated that the membership now consists of ten local authorities and 25 companies. With regard to coke, collaboration had continued throughout the year. Shipments had been in accord with the rules of the Gas Coke Export Association, which was allied to the International Coke Cartel. Shipment business in the area had fallen to a very low level, but the control exercised by the Cartel had prevented prices from falling to an uneconomic level. With the outbreak of hostilities, the future of the Cartel was obscure, but efforts were being made to maintain the framework intact, so that it might be possible to put the machinery fully into operation again immediately after the war. Inland business in the area had been good.

The Industries Fair held each year under the auspices of the National Industrial Development Council of Wales and Monmouthshire was not held this year, so that the Joint Gas Exhibit which had been a feature of recent years was not arranged by the Committee.

The Co-operative Tar Scheme had continued to function satisfactorily throughout the year, though prices for tar products had been very disappointing. Undertakings who were not members were urged to reconsider their position.

The receipts for the year amounted to £46 7s. 8d., and the payments to £41 18s. 7d. With the balance brought forward, this left the sum of £81 19s. 2d. in the hands of the Treasurer, together with £300 of 2½% Consols.

The report and accounts were presented by Mr. MADDEN (as Chairman of the Section), and were adopted on his proposition, seconded by Mr. C. B. FELTON (Ludlow).

Unaccounted-For Gas

The remainder of the time at the disposal of the members was devoted to consideration of a Paper on "Unaccounted-for Gas," the author of which was Mr. C. B. FELTON, of Ludlow. The Paper was published in the issue of the "JOURNAL" for Sept. 27, pp. 713-714; and a summary of the lengthy discussion to which it gave rise will appear in a later issue.

On the motion of the PRESIDENT, the Author was accorded a hearty vote of thanks for his Paper.

A Progressive Gas Undertaking

Following the meeting, members and friends to the number of well over a hundred sat down to luncheon at the Park Hotel. Mr. PROSSER JONES, as President, occupied the chair, and he was supported by (among others) the Lord Mayor of Cardiff (Alderman W. G. Howell); Mr. Robert H. Williams (Chairman of the Cardiff Gas Light and Coke Company), Mr. James Miles (Deputy Chairman), and Mr. Bertrand Turnbull and Mr. L. E. W. Williams (Directors); Mr. H. D. Madden (Executive Chairman of the British Commercial Gas Association); and Mr. Ernest Williams (Chairman of the Aberdare Gas Company). Besides the Loyal Toast, there were only two others—"Cardiff" and "The Association."

Col. W. M. CARR submitted "The City and Trade of Cardiff"—the leading city in the Principality of Wales; beautiful and prosperous. In the course of his remarks, he made reference to the activities of Cardiff's "very excellent gas undertaking." At a gathering of gas engineers, he could say that it was an undertaking of which the Industry as a whole was very proud. It had always been looked upon as one of the most progressive gas undertakings in the country, and influenced for a great many years by excellent management it had provided an example to be followed. Not only this, but the Company and their esteemed Engineer and Manager, Mr. Madden, had always taken a prominent part in helping others. The Industry owed a great debt of gratitude to the Cardiff Gas Company. In connexion with the development of industrial gas sales, for example, a centre which served the whole of South Wales had been set up under the aegis of the Company. A great deal had been done in this way to promote the adoption of the cheapest and most satisfactory form of fuel that was available in this country.

This vehicle, fitted with a gas bag, was exhibited to the members of the Wales and Monmouthshire Association of Gas Engineers and Managers at their meeting at Cardiff. It is a Morris 24 H.P. 30-cwt lorry.

The gas bag was supplied by Messrs. Chesterman & Bottomley, Ltd., Bradford, its measurements being 12ft. × 6ft. × 6ft., and its capacity 432 cu. ft. This is housed on top of the lorry in a box supported by a superstructure, as shown in the photograph.

The only alteration necessary was the fixing of a new gas mixer to the old carburetter, this mixer being of the "G.L.C." type supplied by Messrs. Grant and West, Ltd., London. This mixer enables the lorry to be operated either by gas or petrol on one control. A bag of the capacity mentioned provides the equivalent of approximately 1¾ gallons of petrol, which, in the case of the 30-cwt. lorry referred to, gives a range of 28 to 30 miles to one gas filling.

Although it is expected that the work of converting vehicles in the Cardiff Company's area will be carried out by local automobile engineers, the Company, of course, are prepared to demonstrate the possibilities of town gas for use with motor vehicles to any interested firms.

Gas-Propelled Vehicles

There had been brought along for their inspection that day, continued Col. Carr, a motor vehicle which Mr. Madden had equipped with a gas bag and a carburetter. This was only the first stage. Were it possible to procure the necessary steel cylinders, they would have vehicles supplied with compressed gas to give a range of travel of 100 miles or more per charge. He hoped that in a short time they would have such vehicles on the road, thus conserving petrol for the use of the Forces. For the time being they had had to give way to more urgent needs, but when these cylinders were made available it would be possible to equip transport with an engine more efficient than petrol, more efficient than Diesel oil. It was his hope that, once established in this country, much of the transport would continue permanently to be operated with home-produced motor fuel.

The LORD MAYOR, in his response, cordially congratulated Mr. Prosser Jones upon having attained the position of President of the Association. Cardiff, he said, had now a population of about

250,000, and, in addition to the coal and coke exporting business, it possessed various other industries.

Ever Ready to Help

Mr. GEORGE DIXON, proposing "The Wales and Monmouthshire Association of Gas Engineers and Managers," reminded his hearers that during the years of the last war, 1914-18, the Gas Industry was praised time and again for the great work which it did in connexion with the provision of material for high explosives and of adequate gas supplies for the munition factories. Now, once again, they were in a position to help the Government in the present war, and they were resolved to do this to the very best of their ability. The Fuel and Lighting Order had been relaxed, because the Government had seen that the "cut" which they had visualized as being necessary under the circumstances, did not appear to be so necessary after all. The Government deserved credit for having taken this course.

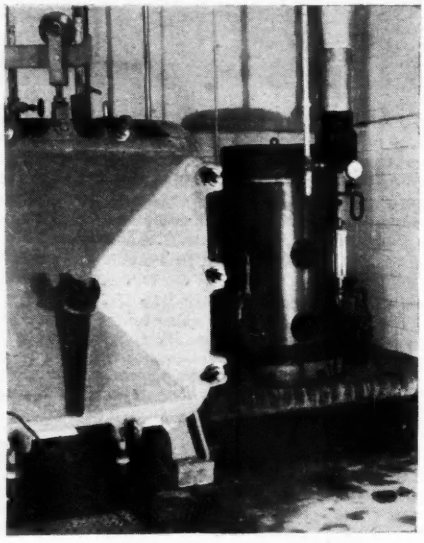
The Wales Association had produced a number of men who had risen to distinguished positions in the Industry, and in the late Mr. Octavius Thomas they had had for many years a Secretary of outstanding personality. When the Association had to take a decision as to whether, in the present circumstances, they were justified in carrying-on with their programme, they had come to the conclusion that, not only should they go on giving the service that they had given before, but they should endeavour, if possible, to give an even better service. He might say that this was a decision which had delighted The Institution of Gas Engineers in London. The Association was quite a good distance from headquarters, but it had always been able to stand upon its own feet. The attendance that day, with all the present travel troubles, constituted a wonderful achievement. The members were giving that "little bit extra" which the Gas Industry always strove to give.

The PRESIDENT, in reply, said the Association had proved itself to be of inestimable benefit to the members and to the undertakings which they had the privilege to control. In addition, the Association had done everything possible to encourage the junior section of the Industry to advance in the profession. The Gas Industry was resolved to do as it did in the last war—place the whole of its by no means insignificant resources at the disposal of the Government.

During the afternoon, an inspection was made of the "gas-bag" lorry equipped by Mr. Madden, to which Col. Carr had made reference in his remarks at the luncheon.

Another Food Factory Adopts Gas for Steam Raising

A Gas-fired Boiler Generating Steam at 60 lb. per sq. in. is supplying all the Steam required for Sterilizing and Cooking Fish and Meat Pastes at an up-to-date factory at East Ham, and giving the utmost satisfaction to the users, who realize that Gas is the ideal fuel for the purpose.



The Controlled Flame Boiler at the Arragon Road food factory and on the left of the picture, a section of one of the retorts in which the foodstuffs are sterilized

HERE is another story of how gas, because of its cleanliness, constancy of supply, and ease of control, has been successfully applied to the generation of steam for the manufacture of foodstuffs. A few months ago we described the gas-fired boiler system adopted at the new production factory of the Eastern Provision Company, Ltd., at Shadwell. Since then a similar system has proved its value at the factory of Messrs. John Barton and Co., Ltd., at Arragon Road, E.6, where thousands of jars of meat and fish pastes are produced daily.

Most of the output of the factory is for the trade, but there are also proprietary lines among the 16 different varieties of paste manufactured at the works, and in both cases it is essential that a high standard of quality and cleanliness should be constantly maintained. Mr. Barton, Managing Director of the Company, who recently showed one of our representatives over the factory, is not by any means a new convert to gas. He realized from the commencement of the meat and fish paste business that it would be highly undesirable, if not impossible, to have a large stock of dust-raising solid fuel in close proximity to the foodstuffs in course of manufacture, and installed a gas-fired boiler which, with the growth of the business, has proved to be only about half as large as his current requirements demand. Consequently in the spring of this year he installed a No. 8.S Controlled Flame boiler, capable of producing 349 lb. of steam per hour.

Having been prepared in modern machinery and under exceptionally clean and hygienic conditions, the pastes are mechanically filled into the glass jars, which are then capped and sealed by machinery. The jars, many hundreds in a batch, are next placed in retorts for the sterilization process, which is carried out in steam under pressures varying from 5 to 15 lb. per sq. in., according to the varieties of food being treated. The boiler provides the steam for the two retorts, each about 4 ft. by 4 ft. by 4 ft., and also generates sufficient steam for a steam-jacketed aluminium pan of 40 gall. capacity for cooking meats of various kinds.

After being sterilized, the jars of paste are labelled and packed for despatch. The factory is centrally heated by coke, and for instantaneous hot water service the premises are equipped with several Ascot gas water heaters.

The No. 8.S boiler generates steam at 60 lb. per sq. in. and is fitted with an electrically-driven feed pump, also a steam injector in addition to automatic gas control. Being vertical in design, the boiler was accommodated easily in the space occupied by the original unit, without the necessity for moving any of the other plant in the factory. Although accommodated on a limited floor area the whole of the boiler is completely accessible by virtue of the design of the unit itself. The makers' standard patent gas regulator is used for the automatic control of the gas supply and is so sensitive that the steam pressure in the boiler is almost constant.

All the condensate from the steam is collected and returned to a hotwell tank, from which it is pumped into the boiler by a motor-driven double-acting boiler feed pump. This use of hot condensate results in fuel saving from its sensible heat content as compared with cold water, and being distilled water it contains no scale-forming salts. A steam injector is fitted as an alternative feed equipment.

The boiler has now been in successful operation for some months and Mr. Barton is completely satisfied with the efficiency resulting from the new installation. As a whole, the factory is a model of order, cleanliness and efficiency; and in these days of international upheaval is contributing in no small measure to the national welfare by producing wholesome food under ideal conditions.

War and Nutrition - - - - - - - - -

By

BARBARA M. HOUSMAN, B.Sc., Member of the British Dietetic Association, Home Service Section, Exeter Gaslight and Coke Company

THE Great War is now past history, but it left behind it numerous proofs of its devastation. As in many cases it is the most obvious which meets the eye and which therefore receives greatest attention and sympathy. Buildings were undoubtedly in sad need of repair and it was because the devastation of material things was so obvious that the Government encouraged not only re-building but also vast schemes for slum clearance. These schemes were vitally necessary, but it is only recently that the public mind has been awakened to a far greater and more far-reaching question—namely, the rebuilding of people's bodies.

We have for long had the phrase C3 hurled at us. The vast Industrial Revolution and prosperity of the Victorian era led to the growth of densely populated cities and towns. Whereas formerly the population had been spread over the country it now became largely congregated in a few big areas. So long as the country was prosperous and had a favourable trade balance few people stopped to think how the people were living and faring. Many of them in 1914 were in a very poor state of health, which the four long war years did nothing to improve but much to harm. The war found us unprepared in many ways and consequently our poor bodies had to make the best of inadequate food supplies.

As a consequence of the post-war slump came the ever-mounting unemployment figures. Not only has the growing generation a background of mal-nourished or under-nourished parentage, but they themselves have never, so to speak, been able to start at scratch, for it is a well-known fact that pre-natal nourishment is most important.

During the last two years many great efforts have been made to tackle the problem of the malnutrition of the nation as a whole. Everywhere the Ministry of Health and Health Councils have tried to make the public realize that it is not *what* one spends on food but *how* one spends which is important, for foods can be filling without being beneficial. Running concurrently with these efforts has been the great National Fitness Campaign. This is excellent in its way, but it is very important to realize that no amount of physical exercise can turn a C3 body into an A1 body—indeed it may actually do much harm. First the C3 body must be made A1 by giving it correct nourishment, and then the physical exercise can help to keep it A1. If the Government has erred it has been because it has tended to over-estimate the value of exercise to a body which may be quite unable to benefit.

Necessary Foods

All who want to see the British nation fit and healthy must be feeling very worried that war has once again broken out, for the public has only just become educated to the fact that quality matters more than quantity, and now restrictions will once again mean a necessarily limited food supply. In view of past history it is, therefore, apparent that we must all make the best use of what is available; it is the individuals who constitute a nation, so that it is the duty of each individual to see that food is used to its best advantage. It is those foods which in peace time may be lacking in a diet which are most likely to be scarce in war time.

It is first and foremost essential that all those engaged in heavy work shall have an adequate supply of energy-giving foodstuffs. In this category are all sugary, starchy, and fatty foods. While the more expensive fats such as butter may be scarce, the sugars and starches are likely to be at least adequate at present, and many of the cheaper fats are just as efficient from the energy giving point of view.

Secondly, all must have an adequate supply of body-building foods; these are particularly important for young and growing children, but are essential for all. In this category are foodstuffs from animal sources—meat, fish, cheese, eggs, and milk being the best examples. To a lesser extent peas, beans, and root vegetables are helpful. These will all be limited in quantity and prices will necessarily rise. Therefore, the very best use *must* be made of what is available.

Thirdly, the protective foods containing vitamins and mineral salts are essential, and these are often neglected even in peace time diets. In this category are fresh fruit and vegetables, butter, brown flour, milk, and "fat" fish. All these are expensive foodstuffs, but they are most important for prevention of diseases which occur when the body is inadequately fed.

How to Ensure Supplies

Having seen what foods are most necessary it will be well to discuss how best to ensure supplies of them. In many cases rationing will be enforced, but much can be done to improve conditions. In the first place money will be saved by buying brown sugar instead of white—the brown sugar is less refined, but is on that score better, for it contains mineral salts which are lacking in the "pure" white sugar. These same mineral salts will be found in honey and treacle, which foodstuffs are, therefore, to be advocated in preference to jams. Probably standard flour will be used, but if not the brown flour is infinitely superior to white flour from a dietetic point of view. During Britain's winter months our local farm butter will be deficient in vitamins, whereas Empire butter, though less expensve, will have come from sunny climates. It will therefore be rich in vitamin content and is preferable to local butter for winter consumption. For many purposes the vitaminized margarines are equal to butter and should therefore be used to save money. Meat and fish will certainly be limited in supply. The cheaper cuts of meat are just as beneficial as the more expensive joints, and if correctly treated by a slow method of cooking are excellent. When and if obtainable a boiling fowl or a rabbit will make an excellent addition to the meat course.

Again the cheaper "fatty" fish such as herrings, mackerel, bloaters, and kippers are often superior in food value to the more expensive "white" fish such as plaice, sole, or haddock. Cheese is an excellent food, and though inferior in flavour many of the Empire cheeses are cheap and effective for use in cooked dishes. Housewives who have preserved eggs will have been wise—if pickled in water glass the eggs will keep for many months, or proprietary storage products take up less space and are equally effective.

Fresh milk is necessary and excellent, but the food value of both skimmed and separated milk (which is often wasted) is much higher than many people imagine—both should be used for cooking where the decreased fat contents can be made good in some other way.

The Government is strongly recommending the home cultivation of fruit and vegetables, and it is to be hoped that this advice will be followed for, however small a space is available, something can always be grown. It is also important to preserve these valuable articles of diet when possible. Beans can be preserved in salt, and root vegetables in sand; most fresh fruit such as apples and pears can be kept for some time if correct storage conditions of humidity, light, and aeration are supplied. Many fruits can be bottled or made into jams and jellies; the home bottling of vegetables, however, is not advocated. It should be particularly noted that the food value of bottled, preserved, or tinned goods is in some cases not equal to that of the fresh products.

How Best to Use Them

Having outlined economical methods of supply and preservation of foods, it will be well to consider who best to use the actual foodstuffs themselves. All housewives will be well advised to spend some time over planning their menus. One hour spent at the beginning of the week will be well worth while—not only will the housewife get as much variety as possible into her meals in this way but she will also save tremendously by seeing that there is no wastage. If she knows exactly what is to be bought she will be wise, for she will be able to avoid the "last minute rush" shopping which is notoriously expensive and may be disastrous in war time, when supplies are limited. By careful planning the housewife can ensure a saving in time, money, and labour for foods not needed all at one meal may be cooked together.

Economy in fuel is a point to be considered and the following advice may be of use to many housewives.

One must undoubtedly cut down the proverbial roasting and frying which seem to be the delight of the English cook, for these methods of cookery are only applicable to the more expensive cuts of meat. If the oven is to be used let it be full, for very little more gas will be consumed with a thermostatically controlled oven whether the oven is filled to capacity or only half-full. If the oven is set on Mark 7 or its equivalent, foods can be cooked as follows:

(a) Top of oven—1. Buns. 2. Scones. 3. Pastry. 4. Batter in sequence.

(b) Centre of Oven—Meat and potatoes.

(c) Bottom of oven—Vegetables, custards, milk puddings, and fish.

Vegetables cooked in the oven in a casserole with the addition of a little fat and water are excellent, for not only is fuel

saved but also the nutriment is conserved in the liquor which can be poured over the vegetables or used for a sauce flavouring. A casserole dish of meat or rabbit and vegetables can be cooked in the oven on No. 4 at the same time as a cake is being baked.

The fate of our bodies is to a very large extent in our own hands, and it is therefore the duty of us all to see:

1. That we leave as much money as possible available for food purchasing; by economy in fuel and meal planning this can be ensured.
2. That we purchase quality rather than quantity, at the same time remembering that it is not necessarily the most expensive which is the most nutritious, and also that the effect of incorrect feeding is far-reaching and not immediate in its effects.
3. That we cook our foodstuffs to the best advantage; cheaper joints cooked by long slow methods are excellent. Always cook fruits and vegetables in their own juices as far as possible.

Lastly, may I say that it is upon the housewives that the onus of responsibility lies, for it is they who buy and cook the food. Moreover, it is into their hands that the health of both the present and future generations has been placed.

Home Service in Wartime

Our Measure of Success in the Domestic Field during the trying times ahead will be determined to a greater extent by the service which we give in general and by the effort of Home Service personnel in particular.

By

F. BACKHOUSE,

Chief in Charge of Home Service Development
United Kingdom Gas Corporation Ltd.,
Central Administration

HOME Service was never more essential than at present. Expert advice on the best utilization of gas under wartime conditions is our duty to consumers, the Industry and the nation alike. Consumer contact must be maintained if retention of the domestic load is to be ensured.

With depletion or suspension of sales staffs, personal contact with consumers is greatly reduced, and Home Service personnel must assume the important rôle of maintaining the goodwill essential to our business. Readjustment of operation of Home Service Departments is no doubt necessary, the extent being governed by local conditions. Different problems present themselves in reception and evacuation areas and a flexible policy is essential.

The general lines of Home Service activity can be summarized under three main heads each serving a useful purpose in its application:

1. Home Service Contact.
2. Women's Gas Associations.
3. Public Demonstrations and Lectures.

Home Service Contact

In conjunction with revised schemes of selling on a cash or modified hire-purchase basis, contact in the home by qualified personnel should be continued. Experience has shown during the past eight weeks a greater receptiveness on the part of consumers to the expert advice provided by home service staffs. Particularly in regard to conservation of heat, twofold processes and the correct application of automatic control in cooking.

With the present necessity for conservation of fuel supplies no better opportunity of proving the economy and efficiency of modern gas appliances has hitherto presented itself. No greater service can at this time be given to consumers than Home Service —the service which sees the women's viewpoint clearly and is best fitted to express in practical terms the value of gas on the wartime "Home Front."

The Industry's Ministry of Information

Develop a Service Information Department ("S.I.D.")—let this become the housewife's "M. of I." during wartime. Advertise its existence, invite consumers to bring you their cooking and catering problems, issue economy menus from day to day and the method of preparation. Make "S.I.D." liaison between consumers and "W.V.S.," give your Home Service Advisor every facility for efficient operation of the department for which she is responsible.

Such an innovation as the Service Information Department would establish proof of the Industry's adaptability in its sincere desire to serve the public and would be greatly appreciated by consumers everywhere.

Special attention should be given to equipment installed in A.R.P. centres, first-aid posts, emergency hospitals and canteens, particularly where such equipment is being used by voluntary workers who may be inexperienced in the use of large-scale appliances. In this connexion the experience of Home Service staffs becomes invaluable in rendering a service to national need.

Women's Gas Association

Members of Women's Gas Associations and Gas Councils, where these exist, should be organized to serve a useful purpose under wartime conditions. Valuable work has already been done in connexion with the Government's Evacuation Scheme and Women's Voluntary Services, but many duties remain which can be undertaken by these bodies.

Direction is now required and Home Service Advisors must take the initiative in revising programmes and utilizing the services of members to the full. By so doing our Women's Organizations remain intact, at the same time serving a national purpose, to say little of the goodwill obtained for the Industry.

The lines upon which the future activities of Women's Gas Associations can be directed are briefly as follows:

(a) Organization of voluntary work to assist in providing the needs of the Services, the Red Cross, evacuees, &c.

(b) Organization of schemes for the purpose of obtaining material for voluntary work.

(c) Organization of a scheme of social service for reception and other areas.

(d) Voluntary staffing of emergency canteens and communal feeding centres, where these exist.

(e) Organization of a scheme of distribution for Ministry of Information propaganda when the contingency arises.

(f) Provision of facilities for wartime cookery instruction and advice on the best application of gas under present conditions.

Public Demonstrations and Lectures

Public Demonstrations and Lectures from the platform are an extension of the Home Service policy applied to the general public and supplementary to individual consumer contact.

Where showroom demonstration theatres exist valuable work can be carried out, although its value must not be over-estimated in comparison with direct home contact, which is the most important function of the Home Service Department.

This supplementary form of service and propaganda adheres to the normal principles, applied to wartime needs, and where employed could, for example, cover the following requirements:

(a) Wartime cookery.

(b) Economical feeding of evacuees (reception areas).

(c) Lectures on "What a Therm of Gas will Do," &c.

(d) Balanced diet with limited incomes and supplies.

The above suggestions may or may not be of value to readers, but in conclusion I cannot refrain from emphasizing the importance of service in retention of the domestic gas load.

Total Sulphur Below 10 Grains/100 Cu. Ft.

Discussion on Mr. Norman Hudson's Paper to the Manchester District Association of Gas Engineers at their General Meeting at Manchester on Oct. 20. The Paper was published in last week's "Journal."

The **President** joined issue with the Author in regard to his statement that there was no commercial plant operating at the time. In August, 1934, such a plant was on order at the Longwood Works, and was operating in 1925. Apparently they were not producing any results which were available to Mr. Hudson. Another point made in the Paper was with regard to the use of gas in rooms where there were no flues. What rate of air change did Mr. Hudson consider to be a minimum, and what concentration did he suggest of SO_2 and CO_2? He could confirm the point with regard to the cleaning of water-heating appliances, which in one case within his knowledge, where the gas was not treated for de-sulphurization, the appliances had to be cleaned much oftener than they were at the works at Longwood.

Mention had been made of the use of tractor vaporizing oil. He had not found that this entirely obviated emulsification, although it was a great improvement from a sludge standpoint. Mr. Hudson had stated the profit on this process to be over 7d. per gallon. Perhaps this was partly accounted for by a very low thermal replacement cost by using coke oven gas to make up. However, this accounted for the remark that Mr. Hudson did not get quite so much benzole from the mixture as he would from a straight horizontal gas. Probably the two balanced one another to some extent. He thought the figure of 1.2d. per therm used by the Author should be increased slightly due to the dry purification costs which were necessary on the crude coke oven gas.

In Huddersfield, when they commenced to wash with gas oil for naphthalene extraction, they were immediately troubled with gum formation and to a very serious extent at their station governors. It was found that an incrustation was formed up to about a quarter of an inch on the governor valve, and so bad did it become that a 36 in. diameter governor was almost put out of action by the tenacity of the substance. However, by returning the heavier solvents—by not putting them back into the washer and putting them into a separate container—the gum trouble was overcome. The percentage of gum in the benzole now extracted was about 8 to 12 milligrams per 100 milli-litres. He did not know why it was put in that form; c.c. would appear to have been better.

Had Mr. Hudson any figures with regard to the reduction of copper in water-heating appliances which he had stressed so much as compared with the percentage production on a gas with a higher sulphur content? If so, they would be very interesting, and give some idea of the proportionate waste.

The Crude Benzole Evaluation Scheme

Mr. G. Claxton, M.Sc. (Research Chemist, National Benzole Co., Ltd.), felt he ought to say something concerning the crude benzole evaluation scheme which Mr. Hudson had taken to task. He had complained that the crude benzole evaluation scheme was based on the assumption that the sulphur in the average benzole was half CS_2 and half thiophene, whereas Mirfield benzole contained a proportion of 70% of CS_2. Mr. Hudson desired, therefore, to receive a higher price for his benzole because it was cheaper to remove CS_2 than the thiophene. The average of 50% of CS_2 in the sulphur of benzole was based on a very large number of tests, and Mr. Claxton thought it was true of the average benzole.

He would like Mr. Hudson to consider a purely hypothetical case of where a benzole was being sent to two different refiners—one of them a large refiner and the other a small one. If the National Benzole Company were to come to Mr. Hudson and offer to pay less for the benzole going to the small works, because their refining costs were higher, then probably Mr. Hudson would be one of the first to say, "No; you must base your price on the average costs." Similarly, the evaluation scheme could not deal individually with benzole such as Mr. Hudson's without making the scheme unduly cumbersome.

He felt sure that the author would remove benzole from his gas, whether it was necessary to remove CS_2 from the gas or not. He had dealt very adequately and very eloquently with the need for also removing CS_2, and Mr. Claxton suggested that any slight loss of revenue which resulted by so doing should be charged to gas purification, and not be made a charge on the National Benzole Company. As a matter of fact, he doubted whether all that magnificent extra revenue due to the low cost of the removal of CS_2 was going to be obtained by the refiner. Low-boiling hydrocarbons were recovered as well as CS_2, and there must be some unusually high losses due to evaporation which to some extent accounted for a difference in price.

Pioneer Work

Mr. N. G. Appleyard (Leeds) said that the experiment made at Mirfield was worthy of praise, and that Mr. Hudson was to be congratulated on having the confidence and courage to do the necessary pioneer work from which the whole Industry must necessarily benefit in the future. The financial results from the production of benzole were very good, and the control and working of the plant did not appear to present any great difficulties. While it might have been better to have installed a new gas washer the conversion of a rotary washer into what would appear to be a semi-rotary static washer was very interesting. Some details of the scheme would be very useful in providing ideas when the overhaul and general repairs to a rotary washer were under review. The elimination of gum trouble from the gas was a very important consideration, and was almost equally important with the elimination of sulphur. If the oils which polymerized to form gums were kept in the benzole instead of being in the gas, it was a transfer to be desired; because in benzole these oils could be prevented from forming gums by the addition of an inhibitator as recommended by the National Benzole Company. Oil-cooling was generally a problem with regard to an oil-washing plant; but as it had not been mentioned in regard to the Mirfield plant that Undertaking must be well-equipped for oil-cooling.

Mention had been made of the oil to oil heat exchanger. Did Mr. Hudson find this method efficient? Mr. Appleyard's experience was that as a means of pre-heating oil there was waste steam which was far more effective, and that the oil to oil heat exchange was not effective as an oil cooler. In a still working at 100° C. only one would have thought that the wash oils would only return the bulk of the higher boiling oils until equilibrium had been reached in a gas with higher boiling bodies such as naphthol.

What was the explanation of a naphthalene free gas? The results obtained by the Author in giving greater satisfaction to the gas consumer by the elimination of objectionable features in the products of combustion, and by making it possible for gas appliances to be efficient and pleasing in their appearance, were in themselves a justification for the installation of the plant described.

Four Years' Operations

Mr. Hudson said that Mr. Singleton had taken him to task about the years mentioned. Actually, the plant was ordered over four years ago, and he had taken the basis of four years as being the period in which they had had the plant more or less in operation. They had had a full three years, and were about to complete the fourth financial year of operation. Actually, they were considering the matter as far back as 1932.

Mr. Singleton had referred to the profit on the benzole recovery as being 7d. per gallon, and had also stated that to the cost of 1.2d. into the holder of the coke oven gas there ought to be added the figure of dry purification. This point was examined carefully, and it was found that the costs of dry purification would not be affected at all; it would not be a figure which was at all computable as a saving if they were not washing for sulphur removal. So he did not think that any figure added to the 1.2d. would be material, and would not affect anything shown in the balance-sheet more than to the extent of £2 or £3 per annum.

Mention had been made of the deposit of gum on the governor. This was exactly the experience at Mirfield—for an area of three-quarters of a mile round the works. Apparently the decision of Huddersfield to extract the heavy wash ends from the medium used for removing naphthalene was a parallel case to the Mirfield plant in which the condensates were returned from the heat exchangers and the column, and in so doing the molecular weight of the washing medium was reduced. With regard to the questions about percentage weight reductions in the material used in the combustion chambers of heating appliances, he could give no figures at all. He was the Manager of a relatively small works, and luxuries were not permitted; but he thought the information could be obtained from tests made by chemists who were devoted more or less their whole time to the study of such subjects.

He thought he would like to treat generally the specific points raised by the representative of the National Benzole Company. He quite agreed that for any new evaluation scheme to operate successfully it must be based on general practice, whereas

the Mirfield benzole was of rather a particular type. If, however, the practice of producing a type of benzole of this description should spread, then it would be necessary, in the interests of the Gas Industry, to make known immediately any snags which reduced income from gas manufacture. There was no doubt, from what he had been told, that the evaluation scheme was based on an assumption that the amount of CS_2 in a benzole having a total sulphur, such as the Mirfield benzole had would be considerably less. It was proved now to be between 66 and 70%, and because of that fact he thought the benzole was entitled to consideration as far as the sulphur penalties were concerned.

Conversion of Brush Washer

Mr. Appleyard had mentioned the conversion of the brush washer to a semi-static rotary washer. This was fairly easily achieved by taking the centre bay out, putting in a central bearing, and the gas was brought through the washer in a normal way but each bay was separately circulated. There was a circulation of each bay with a concentration of benzole increasing towards the low end from which it was pumped up to the still. At the same time quite a good spray effect was obtained in the top of the bays from nozzles, and of course the brushes which were coming out of the oil were constantly saturated with oil. He did not claim that it was anything nearly as efficient as a static washer. Mr. Appleyard had also referred to an inhibitor. The experiment at Mirfield seemed to prove that the gum, or the gum-forming constituents, had been taken out of the gas and were in the benzole. Some tests were made recently on the benzole produced. It was found that with freshly made benzole there were 13 milligrams per c.c. of existent gum. After being treated with cresol the total potential gum was 28 milligrams per c.c. In other words, if they stored the benzole it could be presumed it would never get higher than that figure. The benzole made had a potential total gum, if stored without inhibitory treatment, of 670 milligrams per c.c. So that the ordinary cresol treatment for inhibition did achieve fairly marked success.

With regard to Mr. Appleyard's point concerning the efficiency of oil to oil heat exchange, to be quite frank he could not answer the question in respect to efficiencies. The point at Mirfield had been that there had been surplus exhaust steam, and consequently the actual efficiencies of the heat exchangers had never been tested; but they had arrived at the point of finding they did not even require the oil to oil heat exchange. Oil to vapour in the initial stages of the plant was the only treatment required; so they were now cutting out the oil to oil exchange and using the oil for pre-heating the boiler feed water.

He could not give any actual figures with regard to naphthalene concentration in the washer, but he would obtain some. The tests had shown that the figure of one grain, or just slightly over, say, 1.1, had been maintained through the period of operation of the plant. It was an interesting point, and he would try to get out some figures upon it.

"A Gamble"

Mr. Alex Mackay (Stoke-on-Trent) submitted a written communication as follows: It is difficult to understand Mr. Hudson's statement that his Directors, while being interested in the process he had outlined, were prepared to gamble on the results, for the figures published by a number of undertakings had shown the commercial success of benzole recovery, and had at the same time obtained a reduction in the total sulphur by 50% to nearly 10 grains per 100 cu.ft., with a limited oil circulation. Mr. Hudson must not have been particular to one grain of sulphur when he submitted his scheme, and must have known that he was on safe ground. Figures given by the Author showed that his efficiency of sulphur removal was between 60 and 70% with an oil circulation of 25 gallons per 1,000 cu.ft. of gas treated. These were very fine results, particularly those obtained at periods when he attained as low a figure as 6 grains (which could be called the absolute minimum).

The Stoke-on-Trent Gas Department had approached very near to these figures over the last five years, by obtaining a sulphur removal of 56% and a final result of 11.9 grains per 100 cu.ft., with an oil circulation of 7 to 8 gallons per 1,000 cu.ft. (as compared with Mr. Hudson's 25 gallons). Maximum stripping of the gas had always been their policy, the average yield being well over 3.5 gallons per ton, excluding any heavy fractions produced. It might be said that by using exhaust steam and obtaining low pre-heated oil temperatures of 75 to 85° C. lower working costs could be obtained for steam and wash oil as compared with the use of live steam and pre-heater temperatures of 125 to 135° C. as was the case at Stoke-on-Trent.

On examining the figures in Mr. Hudson's financial data, however, it was seen that he gave a fuel cost of £90 for an annual production of 18,345 gallons of benzole, which was nearly £5 per 1,000 gallons of benzole made. Using the same fuel cost as Mr. Hudson—namely, 10s. per ton, Mr. MacKay found that for the past year's production of 270,000 gallons of crude benzole at Stoke-on-Trent the expenditure was £482, or 35s. 7d. per 1,000 gallons of crude benzole made. Although they had never resorted to experimental work on the quality of various wash oils (due to the satisfactory results and the entire absence of sludging which they always obtained with a particular grade of gas oil), he would be pleased to learn from Mr. Hudson if he could give figures showing, on a working basis, the organic sulphur extracted when using:

(1) Gas oil exclusively; and
(2) Gas oil and Tractor Vaporizing Oil.

If the case of tractor vaporizing oil was not fully supported by its added property of higher absorption of carbon disulphide in practice, the calculated cost of over 7¾d. per gallon appeared rather a high price when compared with Gas Oil at 4¼d. Mr. Hudson's cost of make-up oil per 1,000 gallons of benzole produced was approximately 32s., which compared with 30s. in the case of Stoke-on-Trent. The make-up oil for Mr. Hudson's plant was 49 gallons per 1,000 gallons of crude benzole, against Stoke-on-Trent's figure of 80 gallons.

At Stoke-on-Trent they had always had a particular interest in a low organic sulphur content gas, for this had no doubt been the means of increasing sales to industrial consumers, particularly pottery manufacturers. It was a very important point that the furnace temperature should leave no trace of sulphuring of metallic glazes used on the ware. This had proved to be very successful, so much so that their position to-day was that they had some 66 kilns in operation consuming 1,400 million cu.ft. per year, as against two kilns and a consumption of 40 million cu.ft. six years ago.

Mr. Mackay was anxious to reduce the sulphur compounds still further than the figure of 11.9 grains previously mentioned, but he was adopting a cautious attitude, due to the effect of the reduced smelling properties of the gas, particularly in a district like Stoke-on-Trent, which is prone to fractured mains as a result of mining subsidence. It must not be overlooked that a reduction to the lowest limits was bound to be detrimental to the smelling properties of the town gas, for all the compounds included in organic sulphur (carbon disulphide, mercaptans, naphthalene, pyridine, and thiophene) were the strongly odourant constituents of coal gas. Thus if the organic sulphur was reduced to the lower limits the characteristic smell on which the general public had always depended for its detection would not be so pronounced, which would cause some confusion and a delay in reporting any escapes unless some method was introduced for adding odourants to counteract the abstraction of organic sulphur.

Proven Financial Results

Mr. Hudson said that Mr. Mackay questioned his right to use the word "gamble" inasmuch as the proven financial results from benzole recovery were already in existence. He thought there had been quite a number of letters sent to the Press during recent months in which the question as to whether benzole recovery was a profitable process or otherwise had been debated. Therefore, he did not think Mr. Mackay could take it for granted that everybody was agreed upon the point. They were gambling at Mirfield in one respect. They might have been satisfied that benzole extraction would pay them; but even then they were not interested to exchange and sell a benzole therm in place of a gas therm, even if it showed a slight profit. They were interested in using a benzole revenue to pay for something more than just benzole extraction. They knew that the rate of oil circulation, the possible amount of steam required, the possible supervision, the possible capital expenditure on such a plant, did make the matter, to their minds at any rate, somewhat of a gamble. The fact that some of the figures had worked out far better from a financial point of view than was expected was all to the good. The plant did show a profit on benzole extraction, and had also got rid of the troubles they had had formerly.

Mr. Mackay had questioned quite a number of the figures from Mirfield. The position might be explained by what had been stated earlier on during the reading of the Paper—namely, that the plant put in at Mirfield was experimental in the first place. It was stated that the washer was not as big as it ought to be. There had to be an increased absorptive capacity of the washer by using a lower molecular weight washing medium. For that reason the results obtained could not be compared with the results of a far larger works working on maximum benzole extraction. He did, however, appreciate Mr. Mackay's point with regard to process work, and although Mirfield had not the potential or possible industrial field that an area like Stoke-on-Trent had for pottery, or an area like Sheffield had for steel, yet he could quite readily understand that a low sulphur content gas would be of great advantage when competing for process work.

Bound to be Experimental

Mr. C. Cooper (W. C. Holmes & Co., Ltd.), said that Mr. Hudson had skipped very lightly over the fact that the job was bound to be experimental. It was easy to show on paper that the result could be obtained; that one could bring out some compound of gas without extracting the whole of the benzole. It was on a district that the job should be judged. The opportunity in a given district of getting properly classified results with appliances

on high sulphur gas and then changing on to a low sulphur gas must be very rare. Even cases where an undertaking shut up its own works and took coke oven gas would not necessarily cover the distinction he was making. He thought he was not wrong in stating that this was probably the first case where an entire district had changed over wihout any essential change in the manufacturing processes.

As Mr. Mackay had stated, they had had a heavy reduction of the sulphur in the Stoke area through ordinary benzole extraction; but Mr. Cooper could not remember any consistent data being quoted on the sulphur extraction which could be obtained by ordinary de-benzolizing. Mr. Appleyard had raised a point which he, the speaker, thought was really a simple one. It was enquired how the naphthalene and the other heavy bodies were got rid of with a plant working at only 100° C. He would like to call attention to the fact that the plant was using 0.5 lb. of steam per gallon of oil. This was a much lower figure than would be used in Mr. Appleyard's plant. There was plenty of steam to strip light and heavy bodies entirely.

Mr. Hudson said he wished to make one further remark with regard to Mr. Mackay's contribution. With regard to the figures for sulphur of 11.9 grains and his own varying between 6 and 9 grains. They did maintain 6 to 9 grains of sulphur at Mirfield with an extraction of just over one gallon of benzole per ton. Mr. Mackay's figures were achieved on the full extraction of benzole. Whether he would be able to maintain as low a figure as under 12 grains only extracting half his benzole was a point upon which Mr. Hudson would like some information.

Giving Consumers Better Value

Mr. F. G. Shaw (Buxton) observed that Mr. Hudson had deliberately put down the plant at Mirfield with the object of giving the consumers better value, by de-sulphurizing the gas. Mr. Hudson had said that the commercial value of benzole extraction in smaller works had not always proved to be profitable, and this appeared to be the case. There was a great deal of advocacy from interested parties to prove the reverse; but at the present time he would say that any one of the smaller works who were not extracting benzole at the present time, and who were proceeding to meet a national call by doing so, should receive a subsidy of at least one half the cost from the Government. That was his opinion as to the commercial value of extracting benzole in the smaller works

He had been doing a considerable amount of experimenting on the subject over a period of years. He noticed Mr. Hudson's reference to the washers. At first, he could not understand it, and wondered whether Mr. Hudson was washing gas which contained sulphuretted hydrogen and slight traces of ammonia. It appeared that he did not do so, but that he had divided the washer, and brought the already purified gas back to the new washer. The result of some work Mr. Shaw had done led him to the conclusion that some rather remarkable sulphur extraction results might be obtained in washing which was done while the gas still contained sulphuretted hydrogen and traces of ammonia. Other additions, of course, could be suggested, but he did want to emphasize that point and say how important it was in these days that the mere making of some profit on a by-product should not be deemed worthy of a great deal of consideration when the whole future of the Gas Industry depended not on small economies but in delivering a perfect gas to the contented consumer. He sincerely congratulated Mr. Hudson upon the achievement of his object—namely, the elimination as much as possible of the sulphur compounds from the gas.

A **Student Guest** remarked that Mr. Hudson had mentioned that after the addition of tractor vapourizing oil the formation of gum on appliances in the district was noticeably decreased. He had also stated that he was not aware whether it was the addition of tractor vapourizing oil to the wash oil which caused this result. Had he any further information to impart on the point; or was the result due to the fact that the plant had settled down and a state of equilibrium had been reached whereby the phenols and other inhibitors were no longer being extracted by the wash oil, and were thereby no longer acting as inhibitors of the gum-forming compound? On the other hand, was it definitely due to the different type of wash oil which had been used? He would also like to know if Mr. Hudson had had any emulsification trouble, and had had completely to empty the washer of wash oil, and put in a fresh batch of oil, having found a recurrence of gum troubles.

No Trace of Emulsification

Mr. Hudson said there had never been any traces of emulsification. Never during the nearly four years the plant had been running had they emptied the washer of oil and filled up with new. All that had been done was to drain off any slight accumulations of water in the bottoms of the bays due to faulty separation at the separators. With regard to the question whether the addition of tractor vaporizing oil actually transferred the gum from the gas to the benzole, he could not answer the point. It was only supposition. He admitted in the Paper that at certain times of the year the converted washer was not big enough for the throughput of gas. The first object in adding the T.V.O. was to increase the absorptive capacity per gallon of the oil washing medium by reducing the molecular weight of the washing medium. At the same time, they started running back the refluxes. It was noticeable that from that time the gum troubles in the gas started to disappear, and they began to get them in the benzole. Whether this was due to the washer being too small when using straight wash oil, or whether it was due to using a low molecular weight wash oil by adding the tractor vaporizing oil and so increasing the washer capacity, he could not say, because they had never gone back to the use of a straight wash oil. He could state, however, that when they were using straight wash oil in the washer they could not get down to 10 grains of sulphur. They got down to 13 grains total sulphur, but when they added the T.V.O. they got down to the figure in the Paper varying from 6 to 9 grains. Whether this could be achieved by putting in a new washer of adequate size, he could not say.

Mr. Brian Holmes (W. C. Holmes & Co., Ltd.), thanked Mr. Hudson for the assistance he had rendered in the carrying out of the experiments at Mirfield. New processes and plant which were brought out had to be tested somewhere, and his firm had to thank many members of the Association for help which had been rendered at one time or another. He referred to Mr. Singleton, the President, Mr. A. L. Holton (Manchester), Mr. C. S. Shapley (Leeds), and the late Engineer at Brighouse. He would also like to thank all the Manchester District Engineers who had rendered assistance in the past, and who it was hoped would continue assisting in the future when there were industrial "babies" to hand round, or to be weaned.

Reason for Low Gravity

Mr. James Carr (Stretford), who was unable to stay for the discussion, handed in the following contribution:

We are all agreed on the desirability of removing sulphur compounds which will enable us to make use of flueless appliances. The Author refers to a portion of his oil washing medium being composed of a tractor vaporizing oil, which would imply that it is a light paraffin oil. It would seem that the low gravity of the benzole (0.861) is due to the proportion of the oil fronts that have been distilled with it.

I do not entirely agree with the Author when he says: "If the full volume had been straight coal gas the same purification results would have been achieved." I think the stripping would be seriously affected; as it is with an oil-to-still temperature of only 85° C. and exhaust steam, I doubt the efficiency of the still. The oil circulation on the plant on a "Mirfield" is nearly five times the normal, but on account of the many heat exchanges the steam consumption is only about three times the normal. Should any sludging have occurred the temperature conditions would be greatly affected, and I am somewhat surprised that the Author has not made mention of the sludge in view of the high gum content in the benzole.

With regard to naphthalene, it is interesting to note that the reflux from the two fractionating columns is returned to the washers. The effect of this is that it would appear that the oil in circulation would increase in naphthalene content until it would not strip any more from the gas. Although the gas is lower in naphthalene it is questionable whether it is wise to let so much pass.

If the refluxes were run to a separate tank they could be sold separately; the oil make-up would, however, be higher. The present make-up given by the Author is 900 gallons per annum, or 49 gallons per 1,000 gallons of benzole extracted. This appears to be high considering that the refluxes are being returned to the oil circulation. At Stretford the oil make-up is in the neighbourhood of 39 gallons per 1,000 gallons of benzole extracted. A portion of this oil make-up, however, it due to sludge removal. Probably the reduction in naphthalene is due to slow absorption into the oil until it becomes saturated.

The steam figures given in the Paper I note have been calculated from the rated consumption of the pump. The figures given make the cost of steam 9.76d. per 1,000 lb. which is a very low cost. The other steam consumption is 120 lb. per gallon of benzole on normal benzole plants, but using excessive oil circulation it is in the neighbourhood of 40 lb. per gallon of benzole. The amount of cooling water required at Stretford for the oil coolers is considerable, and is an item we could not leave out of our costing figures. I should also like to know the position at Mirfield in regard to labour charges against the plant.

The following are **Mr. Hudson's** comments on the remarks made by Mr. Carr:

With regard to the low gravity of the benzole, this may be partly due to some small proportion of the oil fronts having been distilled over into the crude benzole. Concerning the statement that the stripping would be seriously affected if the full volume had been straight coal gas, there have been occasions at Mirfield when for 2 or 3 weeks at a time the whole of the gas volume treated has been straight coal gas, and the efficiency of stripping has not been seriously affected—in fact, the results obtained from

the plant have been the same as when treated with a mixture of stripped and unstripped gas.

There have been no sludge troubles whatever on the plant since the mixed type of washing medium was used. The points raised concerning naphthalene were, I think, answered by Mr. Cooper in his contribution to the discussion. As for running the refluxes to a separate tank and selling separately, we find it more advantageous to return the refluxes to the wash oil when washing 2.5 gallons of benzole per ton of coal, although it is obvious that the reflux from the fractionating column would be considerably less if full benzole extraction were being effected, and the control temperature were moved higher than the present figure of 69° C.

Mr. Carr mentions cooling water costs and also cost of labour. At certain times of the year we have surplus water, which we are able to use at other times of the year. If this is not available, we pump round water from the tank of a crude coke oven gas receiving holder, and actually no cooling water costs are incurred, although it is obvious that where water supplies are limited, the cost of this item must be taken into account.

The last point raised is that of the cost of labour, and we have found that we require no permanent attendant on the plant, and the man who attends to exhausters and other machinery has taken on the supervision of this plant without any extra cost to the Company.

Vote of Thanks

Mr. T. Reynolds (Stockport), in moving that the best thanks of the Association be given to Mr. Hudson for his Paper, said that if they could eliminate gum, and get a better sales point by the installation of a plant which would eliminate sulphur, and also break into the market of flueless heaters, then they would be placed upon an even level with the electrical Industry.

Mr. J. E. Lister Cooper (Yeadon) seconded the vote of thanks, which was carried with enthusiasm.

The National Central Library

How it is Helping in Time of War

IN times of peace the British Isles has, in addition to a splendid public library service, a system of library co-operation under which all persons requiring books for any serious purpose are able to obtain them though their local public, university, or other library. The country is divided into a series of Regional Library Systems, each System covering a group of neighbouring counties, and each having a Regional Bureau at which a union catalogue of the non-fiction books in nearly all the libraries in the area has been, or is being, compiled. The keystone of the national system is the National Central Library, which, in addition to being itself a great lending library, is the national centre for the inter-lending of books between one library and another. The system has become so efficient that practically any kind of serious literature can now be obtained on loan. The service is available to every branch of the community, from persons requiring information on the humblest everyday matters to research workers needing highly specialized and technical literature.

In time of war the national library service will not only continue to be of the utmost importance to those who need books for general purposes, but it will also be of greatly increased value to Government Departments, organizations, and persons needing special literature in connexion with work of national importance. The National Central Library will naturally give priority to the latter service, as it is recognized that in tracing material for persons doing research on all forms of armaments, chemicals, foodstuffs, medicine, and so on, the Library will be filling a gap, the existence of which was so serious a drawback during the last war. The organization of the National Central Library, with its great union catalogues and other unique bibliographical material, and the access it has to over twenty-one million books in other libraries in the British Isles, places it in an exceptional position to give a service of special value in time of war. Through it, the whole library system throughout the country will be enabled to render truly national service.

But however important the special war-time service given by British libraries may be, it is also important that as far as possible the normal work of the nation should be provided for. It is essential that the spiritual and intellectual life of the people should be maintained during this time of crisis. That the National Central Library can make its contribution is obvious, and it is to be hoped that not only those connected with national affairs, industry, and commerce, but also those who are needing books for less urgent purposes, will continue to make use of the National Central Library through their local libraries and their Regional Library Systems.

Most of the important libraries having material of research value are already associated with the National Central Library, but it is hoped that any such library not already contributing to the national service will get into touch with the National Central Library, in order that the wealth of literature of which the country is so proud may be placed at the disposal of the nation in this time of emergency.

Owing to the risk of the destruction of property at the headquarters of the National Central Library in London, all the union catalogues, as well as all other irreplaceable or scarce bibliographical material, have been removed to Hemel Hempstead. The non-bibliographical books are remaining at the London headquarters in Malet Place, W.C.1. All applications for books or bibliographical information should be made through the reader's local library, but correspondence on any other subject should be addressed to the National Central Library at Bourne Lodge, Bourne End, Hemel Hempstead, Herts. In cases of difficulty the Librarian will gladly give information about the source from which books may be obtained on loan.

Nottinghamshire and Derbyshire Coals*

Fuel Research Survey Paper

A REPORT on the analysis of commercial grades of coal in the Nottinghamshire and Derbyshire area has been published by His Majesty's Stationery Office. This report, which forms part of the general survey of the national coal resources being carried out by the Fuel Research organization of the Department of Scientific and Industrial Research, presents the results of the analysis of 277 grades of coal from 17 collieries, and is the second to deal with commercial sampling in this area. The work is still proceeding, and will form the subject of future publications.

Broadly, the work of this survey proceeds along two parallel lines. The first of these deals with the seams as they occur below ground, awaiting exploitation, and is therefore of fundamental importance, both now and for the future.

The coal in the seams, however, must be considered as the raw material of the coal producing industry, to be passed through many processes of blending, cleaning and grading before being marketed. The products of the collieries, therefore, differ from the original coal, and each has its own characteristics, dependent on the methods of processing adopted. The second line of investigation of the coal survey is therefore to sample and analyze these products, so that information may be available regarding the types of coals obtainable by consumers.

The present report deals with work of the latter kind. The types of coal obtainable in Nottinghamshire and Derbyshire include those that can be used for the manufacture of metallurgical coke, high grade house and gas coals, locomotive and bunker fuels, and free burning coals for steam raising and general industrial purposes. At the majority of collieries where more than one seam is mined it is the custom in this field to grade each separately.

Samples of the grades were collected by standard methods from a moving stream immediately before the coal was delivered into wagons, either at the side of the picking belts or from the end of the loading jib. When the coal was to be stored in bunkers, sampling was carried out wherever possible as the coal entered the top of the bunkers. The sampling of each grade usually extended over a period of three or four hours, but where there was evidence that a grade was of a heterogeneous nature the period was increased to five or six hours to ensure obtaining a representative sample.

The gross samples so obtained were crushed and reduced in bulk at the colliery. The equipment used for this purpose consisted of a sampling coal crusher mounted on a 35-40 cwt. Morris Commercial chassis. The lorry also served to convey the reduced samples back to the laboratory, where the final grinding and reduction were carried out.

At each colliery visited, all the grades finding a commercial outlet were sampled and analyzed, and in the report the results are grouped in sections dealing with individual collieries. Against the recognized commercial name of each grade is given its screen size and description, including the method of preparation, its uses, and the seam from which it was obtained. This is followed by the analytical data. Proximate analyses, total sulphur and calorific value determinations were carried out on each grade, and an ultimate analysis was made of each of the grades described as "selected." Phosphorus determinations were carried out on grades suited to coke manufacture, or on the finer sizes. Laboratory carbonization assays at 600° C. were also carried out on these coke-producing grades, as well as on some of the "selected" grades.

The report includes discussion of the variability of the grades of coal and of the methods by which they are prepared.

* Fuel Research Survey Paper No. 48—The Yorkshire, Nottinghamshire and Derbyshire Coalfield, Nottinghamshire and Derbyshire Area: Analysis of Commercial Grades of Coal—Part II. Published by H.M. Stationery Office, price 3s. net.

George Wilson Gas Meters Limited

Dividend of 7½%

The third annual meeting of George Wilson Gas Meters was held in Coventry yesterday.

Mr. J. H. Wilson, Chairman and Managing Director, said:

The trading profit for the year, amounting to £11,573 is, I much regret to say, considerably lower than that of last year and I now propose to give you some explanation of this fact, although I imagine that those of you with business experience will readily appreciate the reasons.

Trading Conditions in Past Year

Firstly, the Company has suffered a reduction of turnover owing to a general slowing down of trade which can be traced, to a large extent, to the various crises through which this country has passed. These, naturally, have given rise to a number of difficult problems in the carrying on of business. Nevertheless, every effort has been made to maintain the Company's turnover in the face of these adverse conditions. Secondly, our production costs have increased considerably during the year, in respect of both materials and labour, whilst holidays with pay have again been granted to all the Company's employees.

The rate of Income Tax has, as you know, again been increased and the proportion of the profits absorbed by taxation is greater than last year. The amount required for such taxation is £4,750.

The Preference dividend paid and accrued for the year amounts to £1,856.

The profit remaining, after providing for taxation and the Preference dividend, is £4,961, to which must be added the sum of £10,037 brought forward from last year, resulting in a balance available for distribution of £15,004. Your Directors recommend that this balance be dealt with by payment of a dividend on the Ordinary shares of 7½%, less Income Tax, requiring £2,437, and by carrying forward £12,567.

The carry-forward is thus increased by £2,530. The nett liquid assets, after providing for payment of the proposed Ordinary dividend, show an increase of £4,224 over the previous year, whilst the fixed assets show a reduction of £1,694 being the excess of the provision for depreciation over the expenditure on capital additions during the year. The plant and machinery have been maintained in satisfactory working condition.

Whilst it would have been possible to pay a higher dividend on the Ordinary shares, your Directors have considered it most desirable, in the interests of the Company, to conserve its resources owing to the uncertain nature of trading conditions during the continuation of the present war and particularly during the current year, which is bound to present many difficulties.

New Invention

During the year under review, we have applied the results of an invention which we have been testing over a considerable period. This invention has been evolved to safeguard gas undertakings from losses due to cash shortages in connexion with prepayment meters. The new and outstanding nature of this design will, without doubt, prove of the greatest benefit to our customers who, we feel sure, will rapidly appreciate the advantages and importance of its adoption. At the same time, the improvement has necessitated expense through the re-design of tools, but we are convinced that this expenditure will be a good investment if and when trade conditions revert to normal.

You will appreciate that, at this very early stage of the war, it is most difficult for your Directors to be able to visualize the probable future trend of trade as affecting your Company, and I feel that it would be unwise to take a very optimistic view at the present time. Furthermore, increasing taxation, A.R.P. expenses and War Risks Insurance will have to be contended with. However, I can say that all possible steps are being taken to safeguard the Company's interests and to adapt its organization to current conditions.

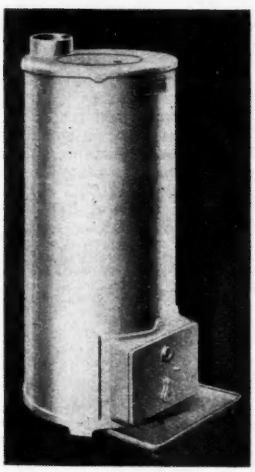
I should like again to pay tribute to the excellent work and assistance given to me throughout the year by my co-directors and by the staff and all our employees at Coventry, London, Manchester, Blackpool, and Leeds.

The report and accounts were unanimously adopted and the dividend of 7½%, less tax, on the Ordinary shares approved.

Trade News

The Eagle Coke Heater.

A coke heater lately introduced by the Eagle Range & Grate Co., Ltd., of Aston, Birmingham, has been specially designed for warming workshops, storerooms, public halls, and sports pavilions. The combustion rate of this heater is under very exact control, to provide a liberal heat output during working hours and slow, economical burning at other times. The slow overnight combustion rate is obtained by means of a simple shutter which partially closes the air inlet port. Re-fuelling is necessary only twice a day—morning and night. Waste of fuel is obviated by the ash-pit door being fitted with a locking device. The Eagle coke heater is available in three sizes, of the following approximate heating capacities: 7,500 cu.ft., 10,000 cu.ft., and 15,000 cu.ft. These figures are based on normal conditions, giving a temperature rise of 25° F.—sufficient for the requirements of the Factories Act, 1937, even when it is freezing outside. In workrooms with two or more outside walls, large areas of glass, with north or east exposure, or walls of a heat-conducting nature, the area warmed will be somewhat less. The normal maximum fuel costs per 24 hours, with coke at 35s. per ton, is stated to be 4d., 5d., and 7d. respectively. The flue outlet is suitable for a 4 in. diameter cast-iron pipe.



"Eagle" Coke Heater

It may be mentioned that John Wright & Co., Ltd. (Radiation, Ltd.), are also producing a special new small size of this heater with a heating capacity of 5,000 cu.ft. This size is particularly suitable for A.R.P. posts and has, indeed, been designed for this purpose.

"Everite" Pressure Pipes

It is nearly eleven years since the first "Everite" asbestos-cement pressure pipes were made at the Widnes works of Turners Asbestos Cement Co., of Trafford Park, Manchester. Additional plant has had to be installed year after year since that time to meet the increasing demand, and by the end of 1938 more than 6,000 miles of these pipes had been laid by supply authorities, local undertakings and industrial concerns. Two entirely new works have been built to cope with the growing demand. One, at Dalmuir, started production last year, and to mark the completion of the other, at Erith, the Company has issued an artistic brochure illustrating and describing the manufacture and use of its product. Among the illustrations are pictures of main laying for the Llanelly Gaslight Company and the Cheltenham Gas Company, and the construction of high-pressure gas mains under main roads conveying heavy traffic for the Pontypool Gas Department. "Everite" pipes are manufactured from a mixture of high-grade asbestos fibre, obtained from the Company's own mines in Rhodesia, and British Portland cement. The mixture is fed to the pipe machine in the form of a thin slurry which is transferred to an endless travelling felt where the excess moisture is extracted. After this operation there remains a firm film of asbestos cement, about 1/100th of an inch thick. The film is conveyed to a polished steel mandrel on which it is rolled up to the required thickness under hydraulic pressure. The result is a strong, homogeneous pipe, the elastic property of which is of special value in that it continues very nearly up to the point of rupture of the material. The pipes are hydraulically tested to twice their working pressure before dispatch from the factories.

Hire Contracts for "Gunfire" Controllers.

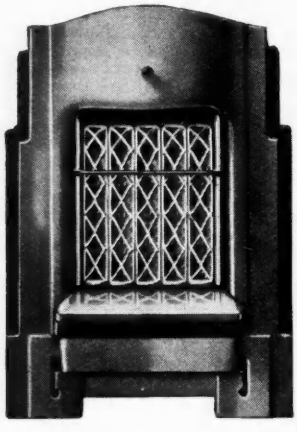
In view of the restrictions placed on all public lighting, the British, Foreign, and Colonial Automatic Light Controlling Company have decided to make no charge for the hire of controllers and time switches out of use owing to hostilities after September, 1939, until such time as the restrictions are again relaxed, but it must be understood that this black-out period be added to the original contract period.

As the duration of this dark period is unknown, the firm feel that it is up to all hirers to undertake to keep controllers protected as far as possible where they are of the open type. A protective wrapping could be used to great advantage, also, an occasional winding would help to preserve a ready utility.

Two Portable Aids to "Emergency" Gas Heating

The NEWSCREEN Fire

An efficient gas-fire of pressed-steel construction, lightweight, and easily carried from room to room and fixed to "plug-in" points. Its extreme lightness has been achieved without lessening its qualities as a thoroughly dependable gas-fire of strong build, fulfilling the requirements of the "Lancet" test. The No. 3205 size can be supplied with a lighter fitted at a convenient point near the top of the frame (see illustration).



Each NEWSCREEN has a loose panel which covers up and protects the radiants when the fire is not in use.

When the fire is in use the panel can be attached to the back of the frame.

A carrying handle is provided at the back above the flue opening.

The NEWSCREEN can be had in a variety of attractive duotone colour finishes.

The GLOWMAIN Heater

A convenient and effective little "flueless" heater, with a very low gas consumption of about 12.5 cubic feet per hour.

Its cast-iron sides are covered internally by a separate chromium-plated lining which keeps the outside from becoming overheated. There is also a separate back with ventilating channels between the exterior back and the reflector.

Direct radiant heat cannot reach the floor. The cast-iron feet ensure rigidity.

A dress-guard is provided and this is sprung into position top and bottom, and can thus be easily removed to allow the reflector to be dusted. The burner and the heating element are also easily removed. A lighter is fitted at the side, as shown.

The GLOWMAIN is obtainable in a choice of colour finishes.

Stock these economical aids to "Emergency" Gas Heating

MAIN

Literature for your Showrooms will be sent on request

R. & A. MAIN LIMITED, LONDON AND FALKIRK

Markets and Manufactures

Current Sales of Gas Products

The London Market

Oct. 30.

There is little change to record in the values of tar products, which are as follows:

Pitch 30s. to 32s. 6d. per ton f.o.b.

Creosote about 5d. per gallon.

Refined tar 3¾d. to 4d.

Pure toluole is nominal at 2s. 6d. to 2s. 7d.

Pure benzole about 1s. 9d.

95/160 solvent naphtha about 1s. 10d.

90/160 pyridine 14s. to 14s. 6d.

All per gallon naked.

Refined naphthalene crystals about £15 per ton in bags.

All *ex* makers' works.

The Provinces

Oct. 30.

Crude Gas-Works Tar, 10s. to 15s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 25s. to 27s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 25s. to 27s.* Toluole, naked, North, 1s. 10d. to 1s. 11d. Coal tar, crude naphtha, in bulk, North 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4¼d. to 1s. 5d. Heavy naphtha, North, 1s. 2¼d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3⅞d. to 4¼d.; low gravity, 4d. to 4¼d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4¼d. to 4¾d. per minimum 40% purely nominal, "B" quality unsaleable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4¾d.; filtered anthracene oil, min. gr. 1,080, 5¼d. to 5¾d.; heavy tar oil, gr. less than 1,080, 4¼d. to 4¾d.

*** All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.**

Scotland

GLASGOW, Oct. 28.

Market remains quietly steady with prompt supplies of the lighter products readily saleable at current prices.

Crude gas-works tar.—Actual value is round 30s. to 32s. per ton *ex* works in bulk.

Pitch of vertical quality can be secured at 24s. to 25s. per ton, f.o.b., for export, and round 20s. to 22s. 6d. per ton *ex* works in bulk for home trade.

Refined tar is available in large quantities at 3¾d. to 4d. per gallon for delivery in the home market, while for export quotations are at 2¾d. to 3d. per gallon, into buyers' packages at makers' works.

Creosote oil.—A small but steady business is being conducted at the following prices: Specification oil, 4¼d. to 4½d. per gallon; low gravity, 5d. to 5¼d. per gallon; neutral oil, 4¾d. to 5d. per gallon; all *ex* works in bulk.

Cresylic acid.—Production is well looked after and current prices are as under: Pale, 97/99%, 2s. to 2s. 3d. per gallon; dark, 97/99%, 1s. 10d. to 2s. per gallon; pale, 99/100%, 2s. 6d. to 2s. 9d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is valued at 6d. to 6½d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—Price of 90/160 grade shows a slight increase at 1s. 6½d. to 1s. 7½d. per gallon. 90/190 grade is unchanged at 1s. 3d. to 1s. 4d. per gallon.

Motor benzole is now called 1s. 5d. to 1s. 6d. per gallon.

Pyridine.—Prices are nominal at 12s. to 13s. per gallon for 90/160 grade and 14s. to 15s. per gallon for 90/140 grade.

Dividends Announced

The Directors of the Montevideo Gas & Dry Dock Co., Ltd., announce the payment on Dec. 1 next of a dividend of 2%, free of income tax, at 7s. in the £, on the ordinary capital of the company, made up as follows: Final.—1% balance in respect of the year 1938 (making with the interim dividend of 1½% paid on Dec. 1, 1938, and the partial final dividend of 1½% paid on May 24, 1939, 4% free of income tax for the year, 1938). Interim.—1% on account of the year ending Dec. 31, 1939, declared by the Board at their meeting held on Oct. 24, 1939.

The Directors of Meters, Ltd., at their meeting on Oct. 27 declared the following on account of the dividends for the current year: On the preference stock at the rate of 5½% per annum (2¾% actual); on the ordinary stock at the rate of 5% per annum (2½% actual).

The dividend warrants will be posted on Nov. 14, and to enable the same to be prepared, the Transfer Books will be closed from Nov. 4 to Nov. 14, both days inclusive.

Contracts Advertised To-day

Tar Still.

Warrington Gas Department. [p. 258.]

War-Time Change of Address

The new emergency address of Cellactite & British Uralite, Ltd., is: Sales Office, Higham, near Rochester, Kent. The telephone number is Shorne 3131; but customers and other friends are asked kindly to use the post as far as they conveniently can, since the telephone service will for a time be limited. For the convenience of those wishing to get in touch with the firm in London, a skeleton staff will for the time being be maintained at Lincoln House, 296-302, High Holborn, W.C. 1.

B.S/A.R.P.2

BITUMINOUS PAINT FOR STEELWORK

METROTECT

a bituminous paint conforming to the above specification, and producing a pleasant satin black finish with highly waterproof and anti-corrosive properties.

Protects steel-work which is continuously immersed in water. Does not "crocodile" on prolonged atmospheric exposure. METROTECT flows freely under the brush and can be applied quickly and without effort even in cold weather.

ALSO AN EXCELLENT BLACK-OUT PAINT FOR WINDOWS AND SKY-LIGHTS.

Prices and further particulars from—

SOUTH METROPOLITAN GAS CO.

REGIS HOUSE, KING WILLIAM STREET, E.C.4.

Telephone: AVENUE 2755.

W E S T ' S

in Wartime

THROUGH the medium of our advertisements we offer this early indication of our policy in the light of existing conditions.

Our friends throughout the Gas Industry are assured that their interests will remain as important to this company as hitherto. Such interruption of normal industrial activities as must occur will not affect our desire to be consulted on all questions relating to the operation of West's Carbonizing Plants. We have complete confidence in the ability of these plants to meet the demands of the future, and a keen sense of the necessity to maintain them at a high level of efficiency. Our resources will be ready during the months ahead to assist the Gas Engineers in this vital responsibility whenever the occasion arises.

WEST'S
CARBONIZING PLANTS

GLOVER-WEST VERTICAL RETORTS ● WEST VERTICAL CARBONIZING CHAMBERS

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GAS STOCKS AND SHARES

The main financial feature last week was the reduction of the Bank Rate from 3 to 2 per cent., the rate at which it stood for seven years prior to the war. On the Stock Exchange this gave a fillip to gilt-edged stocks although after profit-taking prices closed below the best.

The volume of business in the Gas Market is also slowly but surely increasing, although still confined to a few of the leaders and the number of recorded transactions, especially in Gas Light units, was heavier last week. There is no doubt that the relaxing of the Fuel and Lighting Order has had a marked effect on prices, as will be seen in the list below. For the first time since the outbreak of war a parcel of Commercial stock changed hands at 53½ and the quotation closed 5½ points up at 55. South Metropolitan rose 10 points to 70, South Suburban 15 to 85, and Tottenham 5 to 95, while Gas Light units rose a further 1s. to 19s., as compared with 18s. 9d. on Sept. 1. Imperial Continental was marked *ex* dividend and finished the week 6 points up at 83.

At the Provincial Exchanges, Chester ordinary weakened 5 to 101½ and Sheffield eased a point to 121½. A parcel of Swindon stock changed hands at 77 causing a drop of 23 in the nominal quotation and apart from this prices in the Supplementary List closed unaltered.

The Directors of the Oriental Gas Company have declared a final dividend of 4½%, less income tax, for the year ended June 30 last, making 8% for the year, of which the interim payment of 3½% was tax free. This dividend is at the same rate as for 1937-38, although it was then paid tax free for the full year. The price of the stock dropped 5 points to 125 on the announcement.

Another dividend declaration is that by the Directors of the Montevideo Gas and Dry Dock Company who propose to distribute 2%, free of tax, made up as follows:—A final dividend of 1% for the year 1938 (making with the interim of 1½% paid on Dec. 1, 1938, and the partial final of 1½%, paid on May 24, 1939, 4%, free of tax, for the year) and an interim of 1% on account of 1939.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week.
1,767,439	Sept. 4	8	8	Alliance & Dublin Ord. ...	105—115	...
374,000	June 19	4	4	Do. 4 p.c. Deb. ...	80—90	...
877,576	May 8	5	5	Asscd. Gas & Water U'd'ts Ord.	15/—17/-	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...
535,545	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	16/—18/-	...
318,730	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	15/—17/-	...
750,000	Sept. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—90	...
560,070	Aug. 21	7	7	Barnet Ord. 7 p.c.	110—130	...
300,000	Oct. 9	1/9⅜	1/4⅜	Bombay, Ltd.	18/—20/-	...
181,185	Aug. 21	9½	9½	Bournemouth Sliding Scale ...	130—150	...
690,526	,,	7	7	Do. 7 p.c. max. ...	110—130	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	110—120	−9½
50,000	June 5	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	93—98	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	110—115	...
357,900	Aug. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	107—117	...
459,955	,,	6¾	6¾	Do. 5 p.c. Con. ...	100—105	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref. ...	95—105	...
855,000	Sept. 18	8	7	British Ord.	90—100	−5
100,000	June 19	7	7	Do. 7 p.c. Pref.	136—141	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
100,000	22 May '33	6	4	Cape Town, Ltd.	¼—¾	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	¼—¾	...
150,000	June 19	4½	4½	Do. 4½ p.c. Deb.	58—68	...
626,860	July 17	6	6	Cardiff Con. Ord.	95—105	...
237,860	June 5	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
98,936	Oct. 9	2/-	2/-	Colombo Ord.	1½—1¾	...
24,510	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	20/6—22/6	...
739,453	Sept. 27	-/11.48	-/11.48	Colonial Gas Assn. Ltd. Ord. ...	15/6—17/6	...
296,144	,,	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/6—22/6	...
1,775,005	July 31	4	4	Commercial Ord.	50—60	+5½
140,000	Aug. 21	4	4	Do. 4 p.c. Red. Pref. ...	90—95	...
620,000	June 5	3	3	Do. 3 p.c. Deb.	55—60	...
286,344	Aug. 21	5	5	Do. 5 p.c. Deb.	85—95	...
200,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94— 99	...
807,560	July 31	7	7	Croydon sliding scale	100—110	...
644,590	,,	5	5	Do. max. div.	80—85	...
620,385	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
208,660	Aug. 21	5	5	Dudley, Brierley Hill & Dist. Ord.	100—105	...
82,275	,,	5	5	Do. 5 p.c. Con. Pref. ...	92—102	+14½
79,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94—99	...
239,000	July 31	5	5	East Hull Ord. 5 p.c.	86—91	...
187,215	Aug. 21	6	5¾	East Surrey Ord. 5 p.c. ...	98—103	...
176,211	June 5	5	5	Do. 5 p.c. Deb. ...	105—110	...
250,000	July 3	4	8	Gas Consolidation Ord. 'B' ...	18/6—20/6	...
250,000	May 22	4	4	Do. 4 p.c. Red. Cum. Pref.	18/—20/-	+1/
9,172,463	July 31	5¾	5¾	Gas Light & Coke Ord. ...	17/6—19/6*a*	+/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max.	58—63	+3
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	73—78	+½
2,993,000	July 3	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	80—85	...
8,602,497	May 22	3	3	Do. 3 p.c. Con. Deb. ...	60—65	+2
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
1,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	93—98	...
700,000	Sept. 4	3½	3½	Do. 3½ p.c. Red. Ded. ...	85—90	−2½
270,466	July 31	6	6	Harrogate New Cons.	95—100	...
157,500	Mar. 20	‡1/-	‡1/-	Hong Kong and China Ord. ...	⅛—¼	...
5,600,000	Oct. 23	12	4	Imperial Continental Cap. ...	78—88*	+6
172,810	July 31	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
63,480	June 19	3	3	Maidstone 3 p.c. Deb.	57—62	...
45,000	May 22	†10	†10	Malta & Mediterranean	95—105	...
				Metropolitan (of Melbourne) ...		
392,000	Oct. 2	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Aug. 21	5	5	M.S. Utility 'C' Cons.	75—85	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	74—79	...
390,076	June 19	4	4	Do. 4 p.c. Deb. ...	88—93	...
148,955	June 19	5	5	M.S. Utility 5 p.c. Deb. ...	90—100	...
125,000	July 3	3½	3½	Do. 3½ p.c. Red. Bds. ...	92—95	...
675,000	May 8	†6	†3	Montevideo, Ltd.	52—62	...
250,000	Aug. 21	7½	7½	North Middlesex 6 p.c. Con. ...	133—138	...
396,160	July 31	5	5	Northampton 5 p.c. max. ...	101—106	...
300,000	April 24	†9	†7	Oriental, Ltd.	120—130	−5
468,537	June 5	7	8	Plymouth & Stonehouse 5 p.c.	105—115	...
621,667	July 31	8½	8½	Portsmouth & Gosport Cons.	110—120	...
241,446	,,	5	5	Do. 5 p.c. max.	95—100	...
73,350	,,	5	5	Do. 5 p.c. Pref.	80—90	...
75,000	,,	4	4	Do. 4 p.c. Pref.	77—82	...
114,000	July 31	5	5	Preston 5 p.c. Pref.	90—100	...
247,966	June 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	95—100	...
625,959	July 17	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
15,000	Sept. 4	6	6	San Paulo 6 p.c. Cum. Pref. ...	7½—8½	...
441,275	Oct. 9	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	16/—19/-*	...
460,810	Oct. 2	-/10⅜	-/10⅜	,, ,, 4½ p.c. Cum. Pref. ...	16/—18/-	...
133,201	Aug. 21	5	8½	Shrewsbury 5 p.c. Ord. ...	107—117	...
9,000	June 5	‡4	‡4	South African Ord.	4—5	...
1,996,297	Aug. 21	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	15/6—17/6	+/6
1,000,000	,,	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	17/—19/-	−1/
769,191	,,	4	4	Do. 4 p.c. Cum. Pref. ...	15/—17/-	...
450,000	,,	4	4	Do. 4 p.c. Deb.	95—100	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
6,709,895	July 31	6	5	South Met. Ord.	65—75	+10
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	90—100	+5
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	70—80	...
1,895,445	June 19	3	3	Do. 3 p.c. Deb.	60—65	+3
1,000,000	July 17	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
600,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
1,543,795	July 31	6	6	South Suburban Ord. 5 p.c. ...	80—90	+15
512,925	,,	5	5	Do. 5 p.c. Pref.	82—92	...
500,000	,,	4	4	Do. 4 p.c. Pref.	75—85	...
250,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	89—94	...
888,587	June 5	5	5	Do. 5 p.c. Deb.	90—100	...
250,000	,,	4	4	Do. 4 p.c. Deb.	89—94	...
200,000	July 31	3	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
427,859	Sept. 18	1/2⅜	9⅜	S. Western Gas & Water Ord.	14/—16/-	...
160,523	Oct. 9	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6*	...
110,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
750,541	July 31	5½	5	Southampton Ord. 5 p.c. ...	75—85	...
148,836	June 5	4	4	Do. 4 p.c. Deb.	80— 90	...
350,000	July 31	5½	5½	Swansea 5½ p.c. Red. Pref. ...	90—100	...
200,000	June 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	...
1,076,490	July 31	6¾	6¾	Tottenham and District Ord....	87—97	+2
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
62,235	,,	5	5	Do. 5 p.c. Pref.	80—90	...
453,380	June 19	4	4	Do. 4 p.c. Deb.	87—92	...
85,701	June 5	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,247,505	Oct. 23	6	4	U. Kingdom Gas Cor. Ord. ...	13/—16/-*	−1
1,085,952	May 8	4½	4½	Do. 4½ p.c. Ist Cum. Pref. ...	14/—17/-	...
772,709	,,	4	4	Do. 4 p.c. Ist Red. Cum. Pf.	15/—18/-	...
745,263	June 5	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	13/6—15/6	...
1,093,656	Sept 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
378,106	Mar. 6	7	7	Uxbridge, &c., 5 p.c. ...	90—100	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	90—100	...
1,371,138	July 31	7	6½	Wandsworth Consolidated ...	90—100	+5
2,525,768	,,	4	4	Do. 4 p.c. Pref.	65—75	...
1,343,964	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
383,745	,,	4	4	Do. 4 p.c. Deb.	75—85	...
400,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
558,342	July 31	6¼	6¼	Watford and St. Albans Ord. ...	90—100	...
200,000	,,	5	5	Do. 5 p.c. Pref.	80—90	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
200,000	,,	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	90—95	...
100,000	—	—	—	Do. 4 p.c. Red. Pf. (1959)	97—102	...
200,000	June 19	4	4	Do. 4 p.c. Red. Deb. ...	95—160	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Oct. 27.	Rise or Fall on Week.
202,152	Sept. 4	5	5	Ascot Ord.	95—100	...
128,182	July 3	5	5	Do. 5 p.c. Pref.	101—106	...
31,035	Aug. 21	-/4½	-/4½	Associated Utilities 4 p.c. Pref.	15/—17/-	...
100,000	June 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
17,000	Aug. 21	8	8	Bognor Orig. Ord. 'A' ...	137—147	...
62,210	,,	8	8	Do. New Add. 'A' ...	105—115	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	100—110	...
37,440	July 31	10	10	Cam. Univ. & Town 10 p.c. max.	110—120	...
125,970	,,	7	7	Do. 7 p.c. max.	90—100	...
39,025	,,	5	5	Do. 5 p.c. max.	80—90	...
96,410	July 17	4½	4½	Cardiff 4½ p.c. Pref. ...	92—97	...
55,520	July 31	6	6	Colchester 6 p.c. Pref. ...	113—118	...
90,550	Sept. 18	5	5	Do. 5 p.c. Deb. ...	100—105	...
150,000	July 31	4	4	Croydon 4 p.c. Pref.	84—89	...
130,000	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
65,000	Aug. 21	7½	7½	Eastbourne 'A' 5 p.c.	120—130	...
198,000	,,	6	6	Do. 'B' 3½ p.c.	103—113	...
112,312	,,	5	5	Do. 5 p.c. Pref.	100—105	...
130,000	June 19	5	5	Do. 5 p.c. Deb.	105—110	...
130,500	Aug. 10	7½	7½	Exeter New Ord. (£10) ...	13½—15½	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	24—29	...
59,400	,,	7½	7½	Do. 7½ p.c. max. (£30) ...	26—31	...
51,160	June 5	5½	5½	Do. 5½ p.c. Deb.	115—120	...
152,600	Sept. 4	9	8	Guildford Cons.	145—155	...
54,055	,,	5	5	Do. 5 p.c. Pref.	100—105	...
68,250	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
156,600	Aug. 21	7	7	Hampton Court Cons. ...	100—110	...
86,046	June 19	‡4½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
80,000	Aug. 21	4	4	Lea Bridge 4 p.c. Pref.	78—83	...
60,000	,,	6	6	Do. 6 p.c. Pref.	113—118	...
94,876	June 5	4	4	Do. 4 p.c. Deb.	87—92	...
73,620	Sept. 18	8½	8½	Luton Cons. 'A'	150—160	...
107,960	Sept. 18	5½	4	Mid Kent Ord. (£10)	8—9	...
230,940	July 31	10	10	Oxford & District Ord. ...	145—155	...
47,112	,,	5	5	Do. 5 p.c. Pref.	95—105	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	106—111	...
126,193	May 8	7½	7½	Peterborough Ord.	134—139	..
64,990	Sept. 18	7½	7	Redditch Ord.	110—120	...
166,850	July 31	8	8	Romford Ord.	137—142	...
60,000	,,	4	4	Do. 4 p.c. Pref.	95—100	...
44,000	Sept. 18	5	5	Do. 5 p.c. Deb.	105—110	...
25,570	July 31	5½	5½	Rugby 5½ p.c. Pref.	116—121	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	June 5	5½	5½	Do. 5½ p.c. Deb.	113—118	...
110,950	Aug. 21	8	8	Ryde Ord.	137—147	...
270,086	Sept. 4	7	7	Slough Ord.	120—130	...
21,000	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
28,872	May 8	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	16/—18/-	...
28,866	Sept. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
117,228	Aug. 21	7	5	Swindon Cons.	75—80	-23
60,425	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
64,380	June 19	5	5	Torquay & Paignton 5 p.c. Pref.	102—107	...
130,000	Aug. 21	8	5	Wakefield Ord.	101—106	...
81,650	,,	5	5	Do. 5 p.c. max.	81—86	...
82,000	July 31	6	6	Weymouth Ord.	101—106	...
273,626	Aug. 21	7	7	Wolverhampton Cons. Ord. ...	126—131	...
98,384	,,	6	6	Do. 6 p.c. Pref.	113—118	...
160,000	June 19	5½	5½	Do. 5½ p.c. Red. Deb. ...	102—107	...
106,490	Aug. 21	5½	5½	Wrexham Ord.	89—94	...
90,000	June 19	5	5	York 5 p.c. Red. Deb.	102—107	...
133,640	July 31	6½	6	Yorktown (Cam.) 5 p.c. Cons.	112—117	...
120,000	,,	5	5	Do. 5 p.c. Pref.	100—105	...
35,000	June 19	5½	5½	Do. 5½ p.c. Deb.	110—115	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week
347,756	July 31	6	5	Bath Cons.	107—112	...
1,667,250	,,	5	5	Bristol, 5 p.c. max.	97—101	...
120,420	June 5	4	4	Do. 1st 4 p.c. Deb. ...	89—93	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	89—93	...
328,790	,,	5	5	Do. 5 p.c. Deb.	104—109	...
274,000	July 31	5	5	Newport (Mon.) 5 p.c. max. ...	90—95	...
13,200	Sept. 4	8⅔	7	Pontyp'l Gas & W. 10 p.c. 'A'	12—13	...
13,600	,,	6	5	Do. 7 p.c. 'B'	10½—11	...
40,000	,,	6	5	Do. 7 p.c. 'C'	10½—11	...
140,778	July 31	5	5	Weston-super-Mare Cons. ...	93—98	...
64,338	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week
157,150	July 31	6½	5	Chester 5 p.c. Ord.	100—103	-5
92,500	June 5	4	4	Do. 4 p.c. Pref.	85—90	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	86—89	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—100	...
2,167,410	Aug. 21	6	6	Liverpool 5 p.c. Ord.	90—100	...
245,500	June 19	5	5	Do. 5 p.c. Red Pref. ...	100—105	...
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	July 31	10	10	Preston 'A' 10 p.c.	174—184	...
188,219	,,	7	7	Do. 'B' 7 p.c.	126—136	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week
122,577	Aug. 21	8	8	Blyth 5 p.c. Ord.	146½—148½	...
732,000	Aug. 21	3	4	Hartlepool G. & W. Cn. & New	74½—76½	...
2,061,315	July 31	5⅔	5	Newcastle & Gateshead Con.	18/—20/—a	...
682,856	,,	4	4	Do. 4 p.c. Pref.	75—85	...
776,706	June 5	3½	3½	Do. 3½ p.c. Deb.	84—89	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	100—105	...
332,351	Aug. 21	6	6	Sunderland 6 p.c. max. ...	110—120	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week
542,270	Aug. 10	9	6	Derby Con.	110—120	...
55,000	June 19	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 19	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 27.	Rise or Fall on Week
10,000	Aug. 21	10	10	Great Grimsby 'A' Ord. ...	180—190	...
6,500	,,	10	10	Do. 'B' Ord. ...	180—190	...
79,000	,,	10	10	Do. 'C' Ord. ...	175—185	...
1,806,339	Feb. 20	6½	6½	Sheffield Cons.	120—123	-1
95,000	July 3	4	4	Do. 4 p.c. Deb.	99—101	...

a The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

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